



*Florida Department of Transportation*

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July 30, 2015

Khoa Nguyen  
Director, Office of Technical Services  
Federal Highway Administration  
3500 Financial Plaza, Suite 400  
Tallahassee, Florida 32312

Re: State Specifications Office  
Section **105**  
Proposed Specification: **1050803 Contractor Quality Control General Requirements.**

Dear Mr. Nguyen:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

The changes are proposed by Chris Lewis of the State Construction Office and Gevin McDaniel of the State Roadway Design Office to update the language for current Department practice. Companion revisions are proposed in 1020302 Maintenance of Traffic and 5210000 Concrete Barriers, Traffic Railing Barriers and Parapets.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to [daniel.scheer@dot.state.fl.us](mailto:daniel.scheer@dot.state.fl.us).

If you have any questions relating to this specification change, please call me at 414-4130.

Sincerely,

Signature on file

Daniel Scheer, P.E.  
State Specifications Engineer

DS/dt  
Attachment

cc: Florida Transportation Builders' Assoc.  
State Construction Engineer

**CONTRACTOR QUALITY CONTROL GENERAL REQUIREMENTS.****(REV ~~5-126-47-6-15~~)**

SUBARTICLES 105-8.3 thru 105-8.11 are deleted and replaced with the following:

**105-8.3 ~~Worksite Temporary Traffic Supervisor Control (Maintenance of Traffic)~~**

**Personnel:** ~~Provide a Worksite Traffic Supervisor, Flaggers and other personnel who is responsible for initiating, installing, and maintaining all traffic control devices as described in Section 102 and in the Contract Documents. Ensure that the Worksite Traffic Supervisor is certified in the advanced training category by a Department approved training provider. Approved providers will be posted on the Department's website at the following URL address: <http://www.dot.state.fl.us/rddesign/MOT/MOT.shtm>. Use approved alternate Worksite Traffic Supervisors when necessary.~~ **work zone related transportation management and traffic control must obtain training and certification in accordance with the Department's Temporary Traffic Control (Maintenance of Traffic) Training Handbook located at the following URL address: <http://www.dot.state.fl.us/rddesign/TTC/Default.shtm>.**

~~105-8.4 Flagger: Provide trained flaggers to direct traffic where one-way operation in a single lane is in effect and in other situations as required. The Worksite Traffic Supervisor or others as approved by the Department will provide training for flaggers~~

**105-8.5 ~~4~~ Earthwork Quality Control (QC) Personnel:**

**105-8.54.1 Earthwork Level I:** Ensure the technician who samples soil and earthwork materials from the roadway project, takes earthwork moisture and density readings, and records those data in the Density Log Book holds a CTQP Earthwork Construction Inspection Level I qualification.

**105-8.54.2 Earthwork Level II:** Ensure the technician responsible for determining the disposition of soil and earthwork materials on the roadway, and for interpreting and meeting Contract Document requirements holds a CTQP Earthwork Construction Inspection Level II qualification.

**105-8.6 ~~5~~ Asphalt Quality Control (QC) Personnel:**

**105-8.65.1 Plant Technicians:** For asphalt plant operations, provide a QC technician, qualified as a CTQP Asphalt Plant Level II Technician, available at the asphalt plant at all times when producing mix for the Department. Perform all asphalt plant related testing with a CTQP Asphalt Plant Level I Technician. As an exception, measurements of temperature may be performed by someone under the supervision of a CTQP Plant Level II technician.

**105-8.65.2 Paving Technicians:** For paving operations (with the exception of miscellaneous or temporary asphalt), keep a qualified CTQP Asphalt Paving Level II Technician on the roadway at all times when placing asphalt mix for the Department, and perform all testing with a CTQP Asphalt Paving Level I Technician. As an exception, measurements of cross-slope, temperature, and yield (spread rate) can be performed by someone under the supervision of a CTQP Paving Level II Technician at the roadway.

**105-8.65.3 Mix Designer:** Ensure all mix designs are developed by individuals who are CTQP qualified as an Asphalt Hot Mix Designer.

**105-8.65.4 Documentation:** Document all QC procedures, inspection, and all test results and make them available for review by the Engineer throughout the life of the Contract. Identify in the asphalt producer's QC Plan the QC Managers and Asphalt Plant Level II technicians responsible for the decision to resume production after a quality control failure.

**105-8.76 Concrete QC Personnel:**

**105-8.76.1 Concrete Field Technician - Level I:** Ensure technicians performing plastic property testing on concrete for materials acceptance are qualified CTQP Concrete Field Technicians Level I. Plastic property testing will include but not be limited to slump, temperature, air content, water-to-cementitious materials ratio calculation, and making and curing concrete cylinders. Duties will include initial sampling and testing to confirm specification compliance prior to beginning concrete placements, ensuring timely placement of initial cure and providing for the transport of compressive strength samples to the designated laboratories.

**105-8.76.2 Concrete Field Inspector - Level II:** Ensure field inspectors responsible for the quality of concrete being placed on major bridge projects are qualified CTQP Concrete Field Inspectors Level II. A Level II Inspector must be present on the jobsite during all concrete placements. Prior to the placement of concrete, the inspector will inspect the element to be cast to ensure compliance with Contract Documents. A Level II Inspector's duties may include ensuring that concrete testing, inspection, and curing in the field are performed in accordance with the Contract Documents. The QC Inspector will inform the Verification Inspector of anticipated concrete placements and LOT sizes.

**105-8.76.3 Concrete Laboratory Technician – Level I:** Ensure technicians testing cylinders and recording concrete strength for material acceptance are qualified CTQP Concrete Laboratory Technicians Level I. Duties include final curing, compressive strength testing, and the recording/reporting of all test data.

**105-8.87 Supervisory Personnel – Post-Tensioned and Movable Bridge Structures:**

**105-8.87.1 General:** Provide supervisory personnel meeting the qualification requirements only for the post-tensioned and movable bridge types detailed in this Article. Submit qualifications to the Engineer at the pre-construction conference. Do not begin construction until the qualifications of supervisory personnel have been approved by the Engineer.

**105-8.87.2 Proof of License or Certification:** Submit a copy of the Professional Engineer license current and in force issued by the state in which registration is held. The license must be for the field of engineering that the construction work involves such as Civil, Electrical or Mechanical. Under certain circumstances Florida registration may be required.

Submit a copy of the license issued by the State of Florida for tradesmen that require a license indicating that the license is in force and is current. Submit a copy of the certification issued by the Instrumentation, Systems and Automation Society of America for each Certified Control Systems Technician.

**105-8.87.3 Experience Record:** Submit the following information for supervisory personnel to substantiate their experience record. The supervisor (project engineer, superintendent/manager or foreman) seeking approval must provide a notarized certification statement attesting to the completeness and accuracy of the information submitted. Provide the following experience information for each individual seeking approval as a supervisor:

Project owner's name and telephone number of an owner's representative, project identification number, state, city, county, highway number and feature intersected.

Provide a detailed description of each bridge construction experience and the level of supervisory authority during that experience. Report the duration in weeks, as well as begin and end dates, for each experience period.

Provide the name, address and telephone number of an individual that can verify that the experience being reported is accurate. This individual should have been an immediate supervisor unless the supervisor cannot be contacted in which case another individual with direct knowledge of the experience is acceptable.

**105-8.87.4 Concrete Post-Tensioned Segmental Box Girder Construction:**

Ensure the individuals filling the following positions meet the minimum requirements as follows:

**105-8.87.4.1 Project Engineer-New Construction:** Ensure the project engineer is a registered Professional Engineer with five years of bridge construction experience. Ensure a minimum of three years of experience is in segmental box girder construction engineering and includes a minimum of one year in segmental casting yard operations and related surveying, one year in segment erection and related surveying, including post-tensioning and grouting of longitudinal tendons and a minimum of one year as the project engineer in responsible charge of segmental box girder construction engineering. Ensure this individual is present at the site of construction, at all times while segmental box girder construction or segment erection is in progress.

**105-8.87.4.2 Project Engineer-Repair and Rehabilitation:** Ensure the project engineer is a registered Professional Engineer with five years of bridge construction experience. Ensure a minimum of three years of experience is in segmental box girder construction engineering and includes one year of post-tensioning and grouting of longitudinal tendons and a minimum of one year as the project engineer in responsible charge of segmental box girder rehabilitation engineering or segmental box girder new construction engineering.

**105-8.87.4.3 Project Superintendent/Manager-New Construction:** Ensure the project superintendent/manager has a minimum of ten years of bridge construction experience or is a registered Professional Engineer with five years of bridge construction experience. Ensure that a minimum of three years of experience is in segmental box girder construction operations and includes a minimum of one year in the casting yard operations and related surveying, one year in segment erection and related surveying including post-tensioning and grouting of longitudinal tendons and a minimum of one year as the project superintendent/manager in responsible charge of segmental box girder construction operations. Ensure this individual is present at the site of construction, at all times while segmental box girder construction or segment erection is in progress.

**105-8.87.4.4 Project Superintendent/Manager-Repair and Rehabilitation:** Ensure the project superintendent/manager has a minimum of five years of bridge construction experience or is a registered Professional Engineer with three years of bridge construction experience. Ensure that a minimum of two years of experience is in segmental box girder construction operations and includes a minimum of one year experience performing post-tensioning and grouting of longitudinal tendons and a minimum of one year as the project superintendent/manager in responsible charge of segmental box girder rehabilitation operations or segmental box girder new construction operations.

**105-8.87.4.5 Foreman-New Construction:** Ensure that the foreman has a minimum of five years of bridge construction experience with two years of experience in segmental box girder operations and a minimum of one year as the foreman in responsible charge of segmental box girder new construction operations. Ensure this individual is present at the site of construction, at all times while segmental box girder construction or segment erection is in progress.

**105-8.87.4.6 Foreman-Repair and Rehabilitation:** Ensure the foreman has a minimum of five years of bridge construction experience with two years of experience in segmental box girder operations and a minimum of one year as the foreman in responsible charge of segmental box girder rehabilitation operations or segmental box girder new construction operations.

**105-8.87.4.7 Geometry Control Engineer/Manager:** Ensure that the geometry control engineer/manager for construction of cast-in-place box segments is a registered Professional Engineer with one year of experience, a non-registered Engineer with three years of experience or a registered Professional Land Surveyor with three years of experience in geometry control for casting and erection of cast-in-place box segments. Credit for experience in cast-in-place box girder geometry control will be given for experience in precast box girder geometry control but not vice versa.

Ensure that the geometry control engineer/manager for precast box segments is a registered Professional Engineer with one year of experience or non-registered with three years of experience in casting yard geometry control of concrete box segments.

The geometry control engineer/manager must be responsible for and experienced at implementing the method for establishing and maintaining geometry control for segment casting yard operations and segment erection operations and must be experienced with the use of computer programs for monitoring and adjusting theoretical segment casting curves and geometry. This individual must be experienced at establishing procedures for assuring accurate segment form setup, post-tensioning duct and rebar alignment and effective concrete placement and curing operations as well as for verifying that casting and erection field survey data has been properly gathered and recorded. Ensure this individual is present at the site of construction, at all times while cast-in-place segmental box girder construction is in progress or until casting yard operations and segment erection is complete.

**105-8.87.4.8 Surveyor:** Ensure that the surveyor in charge of geometry control surveying for box segment casting and/or box segment erection has a minimum of one year of bridge construction surveying experience. Ensure this individual is present at the site of construction, at all times while segmental box girder construction or segment erection is in progress.

**105-8.87.5 Movable Bridge Construction:** Ensure the individual filling the following positions meet the minimum requirements as follows:

**105-8.87.5.1 Electrical Journeyman:** Ensure the electrical journeyman holds, an active journeyman electrician's license and has at least five years experience in industrial electrical work, or is a Certified Control Systems Technician. A Certified Control Systems Technician will not be permitted to perform electrical power work including, but not limited to, conduit and wire-way installation or power conductor connection. Ensure the electrical journeyman has successfully completed the installation of one similar movable bridge electrical system during the last three years.

**105-8.87.5.2 Control Systems Engineer and Mechanical Systems Engineer:** Ensure the control systems engineer and mechanical systems engineer are both registered Professional Engineers with a minimum of 10 years supervisory experience each in movable bridge construction. Ensure the engineers have working knowledge of the movable bridge leaf motion control techniques, mechanical equipment and arrangements specified for this project. Ensure that each engineer has been in responsible control of the design and implementation of at least three movable bridge electrical control and machinery systems within

the past 10 years of which, at least one of the three bridges was within the last three years. Ensure that a minimum of one of the three bridge designs incorporated the same type of leaf motion control and machinery systems specified for this project.

**105-8.87.6 Concrete Post-Tensioned Other Than Segmental Box Girder**

**Construction:** Ensure the individual filling the following positions meet the minimum requirements as follows:

**105-8.87.6.1 Project Engineer:** Ensure the project engineer is a registered Professional Engineer with five years of bridge construction experience. Ensure that a minimum of three years of experience is in concrete post-tensioned construction. Ensure that the three years of experience includes experience in girder erection, safe use of cranes, stabilization of girders; design of false work for temporary girder support, post-tensioning and grouting operations, and a minimum of one year as the project engineer in responsible charge of post-tensioning related engineering responsibilities.

**105-8.87.6.2 Project Superintendent/Manager:** Ensure the project superintendent/manager has a minimum of ten years of bridge construction experience or is a registered Professional Engineer with five years of bridge construction experience and has a minimum of three years of supervisory experience in girder erection, safe use of cranes, stabilization of girders; design of falsework for temporary girder support post-tensioning, grouting operations and a minimum of one year as the project superintendent/manager in responsible charge of post-tensioning related operations.

**105-8.87.6.3 Foreman:** Ensure the foreman has a minimum of five years of bridge construction experience with two years of experience in post-tensioning related operations and a minimum of one year as the foreman in responsible charge of post-tensioning related operations.

**105-8.87.7 Post-Tensioning (PT) and Grouting Personnel Qualifications:**

Perform all stressing and grouting operations in the presence of the Engineer and with personnel meeting the qualifications of this article. Coordinate and schedule all PT and grouting activities to facilitate inspection by the Engineer

**105-8.87.7.1 Post-Tensioning:** Perform all PT field operations under the direct supervision of a Level II CTQP Qualified PT Technician who must be present at the site of the post-tensioning work during the entire duration of the operation. For the superstructures of bridges having concrete post-tensioned box or I girder construction, provide at least two CTQP Qualified PT Technicians, Level I or II, on the work crew. The supervisor of the work crew, who must be a Level II CTQP Qualified PT Technician, may also be a work crew member, in which case, the supervisor shall count as one of the two CTQP qualified work crew members. For PT operations other than the superstructures of post-tensioned box or I girder construction, perform all PT operations under the direct supervision of a Level II CTQP Qualified PT Technician who must be present at the site of the PT work during the entire duration of the operation. Work crew members are not required to be CTQP qualified.

**105-8.87.7.2 Grouting:** Perform all grouting field operations under the direct supervision of a Level II CTQP Qualified Grouting Technician who must be present at the site of the grouting work during the entire duration of the operation. For the superstructures of bridges having concrete post-tensioned box or I girder construction, provide at least two CTQP Qualified Grouting Technicians, Level I or II, on the work crew. The supervisor of the work crew, who must be a Level II CTQP Qualified Grouting Technician, may also be a work crew member, in which case, the supervisor shall count as one of two CTQP qualified work crew

members. For grouting operations other than the superstructures of post-tensioned box or I girder construction, perform all grouting operations under the direct supervision of a Level II CTQP Qualified Grouting Technician who must be present at the site of the grouting work during the entire duration of the operation. Work crew members are not required to be CTQP qualified.

Perform all vacuum grouting operations under the direct supervision of a crew foreman who has been trained and has experience in the use of vacuum grouting equipment and procedures. Submit the crew foreman's training and experience records to the Engineer prior to performing any vacuum grouting operation.

**105-8.87.8 Failure to Comply with Bridge Qualification Requirements:** Make an immediate effort to reestablish compliance. If an immediate effort is not put forth as determined by the Engineer, payment for the bridge construction operations requiring supervisors to be qualified under this Specification will be withheld up to 60 days. Cease all bridge construction and related activities (casting yard, etc.) if compliance is not met within 60 days, regardless of how much effort is put forth. Resume bridge construction operations only after written approval from the Engineer stating that compliance is reestablished.

**105-8.98 Prestressed Concrete Plant Quality Control Personnel:** Ensure each prestressed concrete plant has an onsite production manager, an onsite plant quality control manager, a plant engineer, and adequate onsite QC inspectors/technicians to provide complete QC inspections and testing.

Ensure the plant manager for QC has at least five years of related experience and a current PCI QC Personnel Level III certification and a certificate of completion of Section 450 Specification examination. Ensure that the QC inspector/technician has current PCI QC Technician/Inspector Level II certification and a certificate of completion of Section 450 Specification examination.

Ensure that the batch plant operators of the ready mixed concrete batch plants meet the requirements of Section 9.2 of the Materials Manual. Ensure that the batch plant operators of the onsite centrally mixed concrete plants meet the requirements of 105-8.11.2.4.2.

**105-8.109 Signal Installation Inspector:** Provide an inspector trained and certified by the International Municipal Signal Association (IMSA) as a Traffic Signal Inspector to perform all signal installation inspections. Use only Department approved signal inspection report forms during the signal inspection activities. Ensure all equipment, materials, and hardware is in compliance with Department Specifications and verify that all equipment requiring certification is listed on the Department's Approved Product List (APL). Provide the completed signal inspection report forms, certified by the IMSA Traffic Signal Inspector to the Engineer.

The Department's approved inspection report forms are available at the following URL: <http://www.dot.state.fl.us/trafficoperations/>.

**105-8.110 Pipe and Precast Concrete Products Manufacturing Facilities Quality Control Personnel:**

**105-8.110.1 General:** Obtain personnel certifications from Department accredited training providers. The list of Department approved courses and their accredited providers is available on the SMO website.

**105-8.110.2 Precast Concrete Drainage Structures, Precast Concrete Box Culvert, Precast Concrete Pipe, Incidental Precast Concrete, and Flexible Pipe Manufacturing Facilities Quality Control Personnel:**

**105-8.110.2.1 Level I Quality Control Inspectors:** Ensure that the Level I Inspectors have completed a minimum of a twelve hour, Department approved, Level I

QC Inspector training course in the respective work area. As an exception to this, ensure Flexible Pipe Level I QC Inspectors have completed a minimum of an eight hour, Department approved, Level I QC Flexible Pipe Inspector training course. For incidental precast concrete, as an alternative to the completion of the twelve hour training course, the Department will accept QC personnel meeting the requirements of 105-8.11.2.4.1 and CTQP Concrete Field Technician Level I certification or Precast/Prestressed Concrete Institute (PCI) Quality Control Technician/Inspector Level II certification.

**105-8.110.2.2 Level II Quality Control Inspectors:** Ensure that Level II Inspectors have completed Department approved Level I QC Inspector training and a minimum of a five hour, Department approved, Level II QC Inspector training course in the respective work areas. For incidental precast concrete, as an alternative to the completion of the five hour training course, the Department will accept CTQP Concrete Field Technician Level II or PCI Quality Control Level III certifications.

**105-8.110.2.3 Plant Quality Control Manager:** Ensure that QC manager has completed Department approved Level II QC Inspector training and has a minimum of two years construction related experience in the specific work area.

**105-8.110.2.4 Additional Requirements for Quality Control Personnel of Precast Concrete Drainage, Precast Concrete Box Culvert, and Incidental Precast Concrete Manufacturing Facilities:**

**105-8.110.2.4.1 Testing Personnel:** Ensure the personnel performing plastic property tests have ACI Concrete Field Testing Technician-Grade I certification. Ensure the personnel performing laboratory compressive strength testing have ACI Concrete Laboratory Testing Technician-Grade I certification or ACI Concrete Strength Testing Technician certification.

**105-8.110.2.4.2: Batch Plant Operator:** Ensure the concrete batch plant operator is qualified as a CTQP Concrete Batch Plant Operator. As an alternative to CTQP qualification, the Department will accept the completion of a minimum of a six hour, Department approved, Batch Plant Operator training course.

**105-8.121 Structural Steel and Miscellaneous Metals Fabrication Facility Quality Control Personnel:** Ensure each fabrication facility has an onsite production manager, an onsite facility manager for QC, a plant engineer, and on site QC inspectors/technicians to provide complete QC inspections and testing.

Ensure that the facility manager for QC and QC inspectors/technicians meet the certification requirements set forth in the latest version of AASHTO/NSBA Steel Bridge Collaboration S 4.1, Steel Bridge Fabrication QC/QA Guide Specification, including the years of experience required in Table 105-5 below. The facility manager for QC must meet the requirements of Table 105-5 for every structural steel member type produced by a plant with QC being managed by the facility manager for QC. The facility manager for QC will report directly to the plant manager or plant engineer and must not be the plant production manager nor report to or be the subordinate of the plant production manager. QC inspectors/technicians must be the employees of, and must report directly to the facility manager for QC.

TABLE 105-5 Experience Requirements for QC Inspectors/Technicians And Facility Manager for Quality Control	
Structural Steel Member Type	Minimum Years of Experience Required

	QC Inspector/Technician	Facility Manager for QC
Rolled beam bridges	1 year	3 years
Welded plate girders (I sections, box sections, etc.)	2 years	4 years
Complex structures, such as trusses, arches, cable stayed bridges, and moveable bridges	3 years	5 years
Fracture critical (FC) members	3 years	5 years

**CONTRACTOR QUALITY CONTROL GENERAL REQUIREMENTS.****(REV 7-6-15)**

SUBARTICLES 105-8.3 thru 105-8.11 are deleted and replaced with the following:

**105-8.3 Temporary Traffic Control (Maintenance of Traffic) Personnel:** Worksite Traffic Supervisors, Flaggers and other personnel responsible for work zone related transportation management and traffic control must obtain training and certification in accordance with the Department's Temporary Traffic Control (Maintenance of Traffic) Training Handbook located at the following URL address:

<http://www.dot.state.fl.us/rddesign/TTC/Default.shtm>.

**105-8.4 Earthwork Quality Control (QC) Personnel:**

**105-8.4.1 Earthwork Level I:** Ensure the technician who samples soil and earthwork materials from the roadway project, takes earthwork moisture and density readings, and records those data in the Density Log Book holds a CTQP Earthwork Construction Inspection Level I qualification.

**105-8.4.2 Earthwork Level II:** Ensure the technician responsible for determining the disposition of soil and earthwork materials on the roadway, and for interpreting and meeting Contract Document requirements holds a CTQP Earthwork Construction Inspection Level II qualification.

**105-8.5 Asphalt Quality Control (QC) Personnel:**

**105-8.5.1 Plant Technicians:** For asphalt plant operations, provide a QC technician, qualified as a CTQP Asphalt Plant Level II Technician, available at the asphalt plant at all times when producing mix for the Department. Perform all asphalt plant related testing with a CTQP Asphalt Plant Level I Technician. As an exception, measurements of temperature may be performed by someone under the supervision of a CTQP Plant Level II technician.

**105-8.5.2 Paving Technicians:** For paving operations (with the exception of miscellaneous or temporary asphalt), keep a qualified CTQP Asphalt Paving Level II Technician on the roadway at all times when placing asphalt mix for the Department, and perform all testing with a CTQP Asphalt Paving Level I Technician. As an exception, measurements of cross-slope, temperature, and yield (spread rate) can be performed by someone under the supervision of a CTQP Paving Level II Technician at the roadway.

**105-8.5.3 Mix Designer:** Ensure all mix designs are developed by individuals who are CTQP qualified as an Asphalt Hot Mix Designer.

**105-8.5.4 Documentation:** Document all QC procedures, inspection, and all test results and make them available for review by the Engineer throughout the life of the Contract. Identify in the asphalt producer's QC Plan the QC Managers and Asphalt Plant Level II technicians responsible for the decision to resume production after a quality control failure.

**105-8.6 Concrete QC Personnel:**

**105-8.6.1 Concrete Field Technician - Level I:** Ensure technicians performing plastic property testing on concrete for materials acceptance are qualified CTQP Concrete Field Technicians Level I. Plastic property testing will include but not be limited to slump, temperature, air content, water-to-cementitious materials ratio calculation, and making and curing concrete cylinders. Duties will include initial sampling and testing to confirm specification compliance prior to beginning concrete placements, ensuring timely placement of

initial cure and providing for the transport of compressive strength samples to the designated laboratories.

**105-8.6.2 Concrete Field Inspector - Level II:** Ensure field inspectors responsible for the quality of concrete being placed on major bridge projects are qualified CTQP Concrete Field Inspectors Level II. A Level II Inspector must be present on the jobsite during all concrete placements. Prior to the placement of concrete, the inspector will inspect the element to be cast to ensure compliance with Contract Documents. A Level II Inspector's duties may include ensuring that concrete testing, inspection, and curing in the field are performed in accordance with the Contract Documents. The QC Inspector will inform the Verification Inspector of anticipated concrete placements and LOT sizes.

**105-8.6.3 Concrete Laboratory Technician – Level I:** Ensure technicians testing cylinders and recording concrete strength for material acceptance are qualified CTQP Concrete Laboratory Technicians Level I. Duties include final curing, compressive strength testing, and the recording/reporting of all test data.

**105-8.7 Supervisory Personnel – Post-Tensioned and Movable Bridge Structures:**

**105-8.7.1 General:** Provide supervisory personnel meeting the qualification requirements only for the post-tensioned and movable bridge types detailed in this Article. Submit qualifications to the Engineer at the pre-construction conference. Do not begin construction until the qualifications of supervisory personnel have been approved by the Engineer.

**105-8.7.2 Proof of License or Certification:** Submit a copy of the Professional Engineer license current and in force issued by the state in which registration is held. The license must be for the field of engineering that the construction work involves such as Civil, Electrical or Mechanical. Under certain circumstances Florida registration may be required.

Submit a copy of the license issued by the State of Florida for tradesmen that require a license indicating that the license is in force and is current. Submit a copy of the certification issued by the Instrumentation, Systems and Automation Society of America for each Certified Control Systems Technician.

**105-8.7.3 Experience Record:** Submit the following information for supervisory personnel to substantiate their experience record. The supervisor (project engineer, superintendent/manager or foreman) seeking approval must provide a notarized certification statement attesting to the completeness and accuracy of the information submitted. Provide the following experience information for each individual seeking approval as a supervisor:

Project owner's name and telephone number of an owner's representative, project identification number, state, city, county, highway number and feature intersected.

Provide a detailed description of each bridge construction experience and the level of supervisory authority during that experience. Report the duration in weeks, as well as begin and end dates, for each experience period.

Provide the name, address and telephone number of an individual that can verify that the experience being reported is accurate. This individual should have been an immediate supervisor unless the supervisor cannot be contacted in which case another individual with direct knowledge of the experience is acceptable.

**105-8.7.4 Concrete Post-Tensioned Segmental Box Girder Construction:** Ensure the individuals filling the following positions meet the minimum requirements as follows:

**105-8.7.4.1 Project Engineer-New Construction:** Ensure the project engineer is a registered Professional Engineer with five years of bridge construction experience.

Ensure a minimum of three years of experience is in segmental box girder construction engineering and includes a minimum of one year in segmental casting yard operations and related surveying, one year in segment erection and related surveying, including post-tensioning and grouting of longitudinal tendons and a minimum of one year as the project engineer in responsible charge of segmental box girder construction engineering. Ensure this individual is present at the site of construction, at all times while segmental box girder construction or segment erection is in progress.

**105-8.7.4.2 Project Engineer-Repair and Rehabilitation:** Ensure the project engineer is a registered Professional Engineer with five years of bridge construction experience. Ensure a minimum of three years of experience is in segmental box girder construction engineering and includes one year of post-tensioning and grouting of longitudinal tendons and a minimum of one year as the project engineer in responsible charge of segmental box girder rehabilitation engineering or segmental box girder new construction engineering.

**105-8.7.4.3 Project Superintendent/Manager-New Construction:** Ensure the project superintendent/manager has a minimum of ten years of bridge construction experience or is a registered Professional Engineer with five years of bridge construction experience. Ensure that a minimum of three years of experience is in segmental box girder construction operations and includes a minimum of one year in the casting yard operations and related surveying, one year in segment erection and related surveying including post-tensioning and grouting of longitudinal tendons and a minimum of one year as the project superintendent/manager in responsible charge of segmental box girder construction operations. Ensure this individual is present at the site of construction, at all times while segmental box girder construction or segment erection is in progress.

**105-8.7.4.4 Project Superintendent/Manager-Repair and Rehabilitation:** Ensure the project superintendent/manager has a minimum of five years of bridge construction experience or is a registered Professional Engineer with three years of bridge construction experience. Ensure that a minimum of two years of experience is in segmental box girder construction operations and includes a minimum of one year experience performing post-tensioning and grouting of longitudinal tendons and a minimum of one year as the project superintendent/manager in responsible charge of segmental box girder rehabilitation operations or segmental box girder new construction operations.

**105-8.7.4.5 Foreman-New Construction:** Ensure that the foreman has a minimum of five years of bridge construction experience with two years of experience in segmental box girder operations and a minimum of one year as the foreman in responsible charge of segmental box girder new construction operations. Ensure this individual is present at the site of construction, at all times while segmental box girder construction or segment erection is in progress.

**105-8.7.4.6 Foreman-Repair and Rehabilitation:** Ensure the foreman has a minimum of five years of bridge construction experience with two years of experience in segmental box girder operations and a minimum of one year as the foreman in responsible charge of segmental box girder rehabilitation operations or segmental box girder new construction operations.

**105-8.7.4.7 Geometry Control Engineer/Manager:** Ensure that the geometry control engineer/manager for construction of cast-in-place box segments is a registered Professional Engineer with one year of experience, a non-registered Engineer with three years of experience or a registered Professional Land Surveyor with three years of experience in

geometry control for casting and erection of cast-in-place box segments. Credit for experience in cast-in-place box girder geometry control will be given for experience in precast box girder geometry control but not vice versa.

Ensure that the geometry control engineer/manager for precast box segments is a registered Professional Engineer with one year of experience or non-registered with three years of experience in casting yard geometry control of concrete box segments.

The geometry control engineer/manager must be responsible for and experienced at implementing the method for establishing and maintaining geometry control for segment casting yard operations and segment erection operations and must be experienced with the use of computer programs for monitoring and adjusting theoretical segment casting curves and geometry. This individual must be experienced at establishing procedures for assuring accurate segment form setup, post-tensioning duct and rebar alignment and effective concrete placement and curing operations as well as for verifying that casting and erection field survey data has been properly gathered and recorded. Ensure this individual is present at the site of construction, at all times while cast-in-place segmental box girder construction is in progress or until casting yard operations and segment erection is complete.

**105-8.7.4.8 Surveyor:** Ensure that the surveyor in charge of geometry control surveying for box segment casting and/or box segment erection has a minimum of one year of bridge construction surveying experience. Ensure this individual is present at the site of construction, at all times while segmental box girder construction or segment erection is in progress.

**105-8.7.5 Movable Bridge Construction:** Ensure the individual filling the following positions meet the minimum requirements as follows:

**105-8.7.5.1 Electrical Journeyman:** Ensure the electrical journeyman holds, an active journeyman electrician's license and has at least five years experience in industrial electrical work, or is a Certified Control Systems Technician. A Certified Control Systems Technician will not be permitted to perform electrical power work including, but not limited to, conduit and wire-way installation or power conductor connection. Ensure the electrical journeyman has successfully completed the installation of one similar movable bridge electrical system during the last three years.

**105-8.7.5.2 Control Systems Engineer and Mechanical Systems Engineer:** Ensure the control systems engineer and mechanical systems engineer are both registered Professional Engineers with a minimum of 10 years supervisory experience each in movable bridge construction. Ensure the engineers have working knowledge of the movable bridge leaf motion control techniques, mechanical equipment and arrangements specified for this project. Ensure that each engineer has been in responsible control of the design and implementation of at least three movable bridge electrical control and machinery systems within the past 10 years of which, at least one of the three bridges was within the last three years. Ensure that a minimum of one of the three bridge designs incorporated the same type of leaf motion control and machinery systems specified for this project.

**105-8.7.6 Concrete Post-Tensioned Other Than Segmental Box Girder Construction:** Ensure the individual filling the following positions meet the minimum requirements as follows:

**105-8.7.6.1 Project Engineer:** Ensure the project engineer is a registered Professional Engineer with five years of bridge construction experience. Ensure that a minimum of three years of experience is in concrete post-tensioned construction. Ensure that the three

years of experience includes experience in girder erection, safe use of cranes, stabilization of girders; design of false work for temporary girder support, post-tensioning and grouting operations, and a minimum of one year as the project engineer in responsible charge of post-tensioning related engineering responsibilities.

**105-8.7.6.2 Project Superintendent/Manager:** Ensure the project superintendent/manager has a minimum of ten years of bridge construction experience or is a registered Professional Engineer with five years of bridge construction experience and has a minimum of three years of supervisory experience in girder erection, safe use of cranes, stabilization of girders; design of falsework for temporary girder support post-tensioning, grouting operations and a minimum of one year as the project superintendent/manager in responsible charge of post-tensioning related operations.

**105-8.7.6.3 Foreman:** Ensure the foreman has a minimum of five years of bridge construction experience with two years of experience in post-tensioning related operations and a minimum of one year as the foreman in responsible charge of post-tensioning related operations.

**105-8.7.7 Post-Tensioning (PT) and Grouting Personnel Qualifications:**

Perform all stressing and grouting operations in the presence of the Engineer and with personnel meeting the qualifications of this article. Coordinate and schedule all PT and grouting activities to facilitate inspection by the Engineer

**105-8.7.7.1 Post-Tensioning:** Perform all PT field operations under the direct supervision of a Level II CTQP Qualified PT Technician who must be present at the site of the post-tensioning work during the entire duration of the operation. For the superstructures of bridges having concrete post-tensioned box or I girder construction, provide at least two CTQP Qualified PT Technicians, Level I or II, on the work crew. The supervisor of the work crew, who must be a Level II CTQP Qualified PT Technician, may also be a work crew member, in which case, the supervisor shall count as one of the two CTQP qualified work crew members. For PT operations other than the superstructures of post-tensioned box or I girder construction, perform all PT operations under the direct supervision of a Level II CTQP Qualified PT Technician who must be present at the site of the PT work during the entire duration of the operation. Work crew members are not required to be CTQP qualified.

**105-8.7.7.2 Grouting:** Perform all grouting field operations under the direct supervision of a Level II CTQP Qualified Grouting Technician who must be present at the site of the grouting work during the entire duration of the operation. For the superstructures of bridges having concrete post-tensioned box or I girder construction, provide at least two CTQP Qualified Grouting Technicians, Level I or II, on the work crew. The supervisor of the work crew, who must be a Level II CTQP Qualified Grouting Technician, may also be a work crew member, in which case, the supervisor shall count as one of two CTQP qualified work crew members. For grouting operations other than the superstructures of post-tensioned box or I girder construction, perform all grouting operations under the direct supervision of a Level II CTQP Qualified Grouting Technician who must be present at the site of the grouting work during the entire duration of the operation. Work crew members are not required to be CTQP qualified.

Perform all vacuum grouting operations under the direct supervision of a crew foreman who has been trained and has experience in the use of vacuum grouting equipment and procedures. Submit the crew foreman's training and experience records to the Engineer prior to performing any vacuum grouting operation.

**105-8.7.8 Failure to Comply with Bridge Qualification Requirements:** Make an immediate effort to reestablish compliance. If an immediate effort is not put forth as determined by the Engineer, payment for the bridge construction operations requiring supervisors to be qualified under this Specification will be withheld up to 60 days. Cease all bridge construction and related activities (casting yard, etc.) if compliance is not met within 60 days, regardless of how much effort is put forth. Resume bridge construction operations only after written approval from the Engineer stating that compliance is reestablished.

**105-8.8 Prestressed Concrete Plant Quality Control Personnel:** Ensure each prestressed concrete plant has an onsite production manager, an onsite plant quality control manager, a plant engineer, and adequate onsite QC inspectors/technicians to provide complete QC inspections and testing.

Ensure the plant manager for QC has at least five years of related experience and a current PCI QC Personnel Level III certification and a certificate of completion of Section 450 Specification examination. Ensure that the QC inspector/technician has current PCI QC Technician/Inspector Level II certification and a certificate of completion of Section 450 Specification examination.

Ensure that the batch plant operators of the ready mixed concrete batch plants meet the requirements of Section 9.2 of the Materials Manual. Ensure that the batch plant operators of the onsite centrally mixed concrete plants meet the requirements of 105-8.11.2.4.2.

**105-8.9 Signal Installation Inspector:** Provide an inspector trained and certified by the International Municipal Signal Association (IMSA) as a Traffic Signal Inspector to perform all signal installation inspections. Use only Department approved signal inspection report forms during the signal inspection activities. Ensure all equipment, materials, and hardware is in compliance with Department Specifications and verify that all equipment requiring certification is listed on the Department's Approved Product List (APL). Provide the completed signal inspection report forms, certified by the IMSA Traffic Signal Inspector to the Engineer.

The Department's approved inspection report forms are available at the following URL: <http://www.dot.state.fl.us/trafficoperations/>.

**105-8.10 Pipe and Precast Concrete Products Manufacturing Facilities Quality Control Personnel:**

**105-8.10.1 General:** Obtain personnel certifications from Department accredited training providers. The list of Department approved courses and their accredited providers is available on the SMO website.

**105-8.10.2 Precast Concrete Drainage Structures, Precast Concrete Box Culvert, Precast Concrete Pipe, Incidental Precast Concrete, and Flexible Pipe Manufacturing Facilities Quality Control Personnel:**

**105-8.10.2.1 Level I Quality Control Inspectors:** Ensure that the Level I Inspectors have completed a minimum of a twelve hour, Department approved, Level I QC Inspector training course in the respective work area. As an exception to this, ensure Flexible Pipe Level I QC Inspectors have completed a minimum of an eight hour, Department approved, Level I QC Flexible Pipe Inspector training course. For incidental precast concrete, as an alternative to the completion of the twelve hour training course, the Department will accept QC personnel meeting the requirements of 105-8.11.2.4.1 and CTQP Concrete Field Technician Level I certification or Precast/Prestressed Concrete Institute (PCI) Quality Control Technician/Inspector Level II certification.

**105-8.10.2.2 Level II Quality Control Inspectors:** Ensure that Level II Inspectors have completed Department approved Level I QC Inspector training and a minimum of a five hour, Department approved, Level II QC Inspector training course in the respective work areas. For incidental precast concrete, as an alternative to the completion of the five hour training course, the Department will accept CTQP Concrete Field Technician Level II or PCI Quality Control Level III certifications.

**105-8.10.2.3 Plant Quality Control Manager:** Ensure that QC manager has completed Department approved Level II QC Inspector training and has a minimum of two years construction related experience in the specific work area.

**105-8.10.2.4 Additional Requirements for Quality Control Personnel of Precast Concrete Drainage, Precast Concrete Box Culvert, and Incidental Precast Concrete Manufacturing Facilities:**

**105-8.10.2.4.1 Testing Personnel:** Ensure the personnel performing plastic property tests have ACI Concrete Field Testing Technician-Grade I certification. Ensure the personnel performing laboratory compressive strength testing have ACI Concrete Laboratory Testing Technician-Grade I certification or ACI Concrete Strength Testing Technician certification.

**105-8.10.2.4.2: Batch Plant Operator:** Ensure the concrete batch plant operator is qualified as a CTQP Concrete Batch Plant Operator. As an alternative to CTQP qualification, the Department will accept the completion of a minimum of a six hour, Department approved, Batch Plant Operator training course.

**105-8.11 Structural Steel and Miscellaneous Metals Fabrication Facility Quality Control Personnel:** Ensure each fabrication facility has an onsite production manager, an onsite facility manager for QC, a plant engineer, and on site QC inspectors/technicians to provide complete QC inspections and testing.

Ensure that the facility manager for QC and QC inspectors/technicians meet the certification requirements set forth in the latest version of AASHTO/NSBA Steel Bridge Collaboration S 4.1, Steel Bridge Fabrication QC/QA Guide Specification, including the years of experience required in Table 105-5 below. The facility manager for QC must meet the requirements of Table 105-5 for every structural steel member type produced by a plant with QC being managed by the facility manager for QC. The facility manager for QC will report directly to the plant manager or plant engineer and must not be the plant production manager nor report to or be the subordinate of the plant production manager. QC inspectors/technicians must be the employees of, and must report directly to the facility manager for QC.

Structural Steel Member Type	Minimum Years of Experience Required	
	QC Inspector/Technician	Facility Manager for QC
Rolled beam bridges	1 year	3 years
Welded plate girders (I sections, box sections, etc.)	2 years	4 years
Complex structures, such as trusses, arches, cable stayed bridges, and moveable bridges	3 years	5 years

TABLE 105-5 Experience Requirements for QC Inspectors/Technicians And Facility Manager for Quality Control		
Structural Steel Member Type	Minimum Years of Experience Required	
	QC Inspector/Technician	Facility Manager for QC
Fracture critical (FC) members	3 years	5 years