

CHAPTER 11.1 Volume I

FABRICATION AND INSPECTION OF STRUCTURAL METAL, METAL COMPONENTS AND PROTECTIVE COATINGS QUALITY ASSURANCE PROGRAM

11.1.1 PURPOSE

This procedure provides guidance to Florida Department of Transportation (**Department**) personnel and their representatives for the development and implementation of the **Department** Quality Assurance (QA) program for the fabrication of structural steel, metal components, and protective coatings.

11.1.2 AUTHORITY

Sections 20.23(4)(a) and 334.048(3), Florida Statutes

11.1.3 REFERENCES

American Association of State Highway Transportation Officials/National Steel Bridge Alliance (AASHTO/NSBA) Steel Bridge Collaboration, Steel Bridge Fabrication QC/QA Guide Specification

American Welding Society QC1:2007 Standard for AWS (AWS) Certification of Welding Inspectors (CWI) Program

Code of Federal Regulations (CFR), Federal-Aid Policy Guide (FAPG), Subchapter G – Engineering and Traffic Operations, Part 637 – Construction Inspection and Approval, Subpart B – Quality Assurance Procedures for Construction

American Welding Society (AWS) ANSI/AASHTO/AWS D1.5, Bridge Welding Code

American Welding Society (AWS) D1.1/D1.1M, Structural Welding Code – Steel

Florida Department of Transportation Construction Project Administration Manual (CPAM)

Florida Department of Transportation (FDOT) Standard Specification for Road and Bridge Construction

FDOT Local Agency Program Manual

Materials Manual Volume II – Chapter 11.1 Fabrication and Manufacturing of Structural Metal, Metal Components, and Protective Coatings Quality Control Program

Research Council on Structural Connections (RCSC) Specification for Structural Joints Using High-Strength Bolts.

Structures Design Guidelines, Florida Department of Transportation - Structures Design Office, Procedure No. 625-020-150

11.1.4 SCOPE

This procedure establishes the **Department's** requirements and activities for Quality Assurance (QA) of fabricated structural steel, metal components, and protective coatings; discusses the **Department's** scope for commercial inspection; and guides **Department** personnel and their representatives regarding their responsibilities for the determination of materials compliance on all **Department** projects.

11.1.5 FUNCTIONS AND RESPONSIBILITIES OF THE STATE MATERIALS OFFICE (SMO)

11.1.5.1 General

The SMO will perform the processes required for the acceptance of facilities producing structural steel, metal components, and protective coatings for the **Department**. The processes will include the review of the facility's proposed Quality Control Plan (QCP), performance of an onsite inspection at the facility, and review of the facility's QC and/or QA records or other related information that may be needed. The SMO or their representatives will perform QA inspection audits of such facilities. The SMO will maintain the **Production Facility Listing** for metals and coatings indicating the status of each facility's acceptance.

The SMO and the Districts work together to provide commercial inspection on active **Department** projects. The Quality Assurance Inspectors (QAI) firm contracts are maintained by the SMO and commercial inspection services are made available to the Districts through these contracts for active construction projects.

11.1.6 FUNCTIONS AND RESPONSIBILITIES OF QUALITY ASSURANCE INSPECTORS

For the QAI to be activated by the SMO, funds must be approved through the applicable work program and encumbered on a task work order (TWO) assigned to the project before the QAI can start work.

11.1.6.1 Services Provided by the QAI

QAI provides an array of services on behalf of the **Department** to ensure the proper production of steel fabricated products. Services may include but are not limited to the review of materials; witness of fabrication and manufacturing; witness of welding, bolting and coating operations; review of non-destructive testing; review of welder qualification, review of welding procedures; and bolting inspection.

11.6.1.2 Function of the QAI

The QAI provides a critical function to the State of Florida by witnessing fabrication, coating and repairs of structural components on behalf of the **Department**. Each approved facility on the **Production Facility Listing** has their own internal QA department, qualified personnel and QCP. QAI provides an oversight function for the **Department**. They will have full access on the job site and to all production facilities where **Department** projects are being fabricated, manufactured, erected, bolted, coated or repaired.

The detailed functions of the QAI are as described in the document "American Association of State Highway Transportation Officials/National Steel Bridge Alliance (AASHTO/NSBA) Steel Bridge Collaboration, Steel Bridge Fabrication QC/QA Guide Specification, except as modified and/or amended below.

QAI will have access to the facility QCP, applicable drawings, welding procedures and all documentation related to verification of compliance. QAI will evaluate the facility's compliance with the approved QCP and contract document requirements. QAI will document and notify the facility Quality Control Manager (QCM), as soon as possible, of any deficiencies noted during the QA inspection. After notifying the QCM, the inspector will follow up on each issue to assure corrective action has been taken to resolve the deficiency. The timeliness of actions by the facility will be documented.

If the deficiencies affect the structural or functional performance, or the durability of an item, component, sub-assembly and/or assembly, or when the facility does not take timely action to satisfactorily resolve deficiencies, the QAI will notify the Engineer and the SMO. The SMO will immediately review the file, review actions taken by the facility and, if necessary, notify

the facility, Prime Contractor (if different from the facility owner), and the Engineer in writing that the facility's accepted status required by **Specification Section 460** may be changed.

Questions of acceptability before stamping members shall be resolved with proper input from the QAI prior to shipping to the job site. The Engineer may also request input from the QAI to resolve damage occurred after shipment.

Each inspection firm will distribute TWO-specific reports that provide a summary of the project details as witnessed during the fabrication process. The reports should be distributed to the Engineer and the SMO. Additional personnel who would like to receive these reports can alert the District Project Administrator, Construction Engineer Inspector or SMO.

11.6.1.3 QAI Qualifications

The required qualifications of the QAI are as described in the AASHTO/NSBA Steel Bridge Collaboration, Steel Bridge Fabrication QC/QA Guide Specification, S 4.1 (AASHTO SBFQC-1), except as amended by the **Department** contractual documents.

All inspectors responsible for QA activities involving high strength bolting as described in **Specification Section 460** shall be knowledgeable of the requirements of the "Research Council on Structural Connections (RCSC) Specification for Structural Joints Using High-Strength Bolts".

All inspectors responsible for QA should be qualified for protective coatings in accordance with **Specification Section 560**.

The inspectors performing QA activities not described herein need to be experienced with the work being observed and as approved by the Engineer. The QAI firm will be responsible to ensure that all the QA inspection personnel maintain the required accreditation for the type of work they are performing.

11.1.7 COMMERCIAL INSPECTION

Commercial Inspection is a vital part of the QA Program for structural steel, metal components, and protective coatings. Commercial inspection is used to ensure that the inspected components are fabricated as per design as well as to ensure the safety of the traveling public. Components that require commercial inspection and additional components that can be requested for inspection are identified in **Table 1**.

Table 1 – Components Requiring Commercial Inspection
Required by Specifications
Aluminum J-Arms
Bridge Bearings (Pot, Disc, Rocker, Roller, Sliding, Spherical, Load Plates)
Bridge Machinery
Overhead Cantilever
Overhead Gantry
Overhead Monotube
Overhead Span
Overhead Truss
Shop Painting
Shop Steel Metalizing
Steel Bridge (Vehicular: Simple, Intermediate, Advanced, Fracture Critical)
Steel Bridge (Pedestrian)
Steel Modular Joints (Expansion, Finger)
At the Request of the Engineer
Steel Cable (Suspension, Bridge Stay, Guardrail)
Field Bolting
Field Welding
Buildings
Other Non-Standard Fabrication

The State Materials Office will assign a TWO to a project based on the information supplied by the Districts (note that more than one QAI may be assigned to any single project or any one QAI may be assigned to multiple projects).

QAI personnel may also be assigned to work on Local Agency Program (LAP) projects that may be subject to Commercial Inspection per the Local Agency Program Manual. Fabrication for other local programs may also be subject to commercial inspection per the authority of their governing statutes. Should the scope of any local program project include fabrication of any required components in **Table 1**, and erection will be over a state owned or maintained road, please contact the SMO for support to ensure commercial inspection is performed by a qualified QAI firm.

11.1.7.1 Responsibilities of The Districts

District Construction should identify those projects that require commercial inspection. Once identified, District Construction should request assignment of funds in their District’s work program to cover the costs of the inspection.

Construction Project Managers are required to notify the SMO of the commercial inspection needs for a project at least 30 days prior to the beginning of fabrication, and to send the SMO a completed Form # 675-070-07 “Request for Commercial Inspection and Testing of Structural Metal and Coatings for the project”.

FORMS

The following form may be obtained from the **Department** forms library at the **Department** forms and procedure website.

Form No. 675-070-07 Request for Commercial Inspection and Testing of Structural Metals and Coatings