



Designation: D 5339 – 94 (Reapproved 1998)

Standard Practice for Quality Assurance Plan for Structural Steel Fabrication for Highway Structures¹

This standard is issued under the fixed designation D 5339; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice establishes procedures for a quality assurance plan for structural steel fabrication for highway structures. These procedures pertain to the inspections, measurements, and tests necessary for the fabricator and owner to substantiate material and product conformance to contract requirements. The fabricator's quality control plan (QCP) is to be designed and implemented with the objective of ensuring that all materials incorporated into the work conform to contract requirements. The owner's acceptance testing plan (ATP) is designed to provide assurance that the fabricator has successfully met this objective.

1.2 Inherent in this practice is the assumption that design details and specifications allow maximum flexibility in procedures and processes to allow the most cost-effective fabrication to be performed consistent with the quality level specified.

1.3 Alternative sampling methods, processes, procedures, and inspection equipment may be used by the fabricator when such procedures and equipment provide, as a minimum, the quality assurance required by the contract documents. Prior to applying such alternative procedures, the fabricator is to describe the procedure in a written proposal, and demonstrate to the satisfaction of the owner that the effectiveness of these alternative procedures are equal to or better than the contract requirements. In case of dispute, the procedures stipulated in the contract documents will apply.

2. Referenced Documents²

2.1 ASTM Standards:

E 543 Practice for Agencies Performing Nondestructive Testing³

2.2 ANSI/AASHTO/AWS Codes:

D1.5 Bridge Welding Code⁴

ANSI/AWS D1.1 Structural Welding Code—Steel⁴

2.3 AISC Publication:

AISC Quality Certification Program⁵

2.4 American Society for Nondestructive Testing, Inc.
Publication:

Recommended Practice No. SNT-TC-1A⁶

3. Terminology

3.1 Definitions:

3.1.1 *acceptance testing*—testing performed by the owner as part of the ATP.

3.1.2 *acceptance testing inspector, ATI*—an employee or representative of the owner, responsible for performance of duties specified in the ATP.

3.1.3 *acceptance testing plan, ATP*—the formal procedures adopted by the owner to monitor the fabrication process to ensure that the quality levels specified are being achieved. This also includes a description of corrective actions to be taken by the fabricator when the fabricator is not controlling the fabrication operation according to the accepted QCP.

3.1.4 *engineer*—the State Highway Engineer of a Highway/Transportation Department/Agency, or authorized representative, limited by the scope of duties as assigned by the transportation agency.

3.1.5 *fabricator*—the contractor/subcontractor/fabricator/shop (hereinafter referred to as the fabricator) that provides the materials and processes to fabricate structural steel members.

3.1.6 *nondestructive testing, NDT*—the type of testing of the material or processes involved in the fabrication that does not require removal of material, or changes in the material characteristics, that would alter the behavior of the finished product.

¹ This practice is under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.32 on Bridges and Structures.

Current edition approved Jan. 15, 1994. Published March 1994.

² In the Referenced Documents, *quality control*, *quality assurance*, and related terms may be defined differently.

³ *Annual Book of ASTM Standards*, Vol 03.03.

⁴ Available from American Association of State Highway and Transportation Officials, 444 N. Capitol Street, S.W., Suite 225, Washington, DC 20001 or from American Welding Society, Inc., 550 N.W. LeJeune Rd., P.O. Box 351040, Miami, FL 33135.

⁵ Available from American Institute of Steel Construction, 400 North Michigan Avenue, Chicago, IL 60611.

⁶ Available from the American Society for Nondestructive Testing, Inc. 4153 Arlington Plaza, Caller 28518, Columbus, OH 43228-0518.

3.1.7 *owner*—a transportation agency with the responsibility for planning, contracting, erecting and maintaining a fabricated structure.

3.1.8 *quality assurance plan, QAP*—the QAP consists of the fabricator's quality control plan (QCP) and the owner's acceptance testing plan (ATP), and is intended to ensure that materials, personnel, procedures, and processes utilized during fabrication of steel members meet the quality levels specified in the contract.

3.1.9 *quality control inspector, QCI*—the fabricator's representative responsible for performance of duties specified in the QCP.

3.1.10 *quality control plan, QCP*—the formal written document that is composed by the fabricator to indicate the procedures to be followed to produce a product meeting the level of quality as specified by the contract.

4. Summary of Practice

4.1 The QAP is composed of the fabricator's QCP and the owner's ATP. The fabricator's QCP includes inspection and testing. The owner's ATP provides for inspection and testing procedures for acceptance testing.

4.2 Standard acceptance testing procedures usually require the owner to provide independent testing personnel and equipment, but at a reduced level of testing as compared to QC testing. The owner's acceptance tests can be by "performing" independent tests, or "witnessing" QC tests, or both. Either method of acceptance testing can be used with this practice. If independent testing is used the owner will supply the necessary personnel and testing equipment.

4.3 This practice assumes a specified level of quality. As part of this specified level, the fabricator must have a QC plan acceptable to the owner prior to commencement of work.

4.4 This practice includes a requirement for fabricating shop certification meeting the requirements of the AISC Quality Certification Program, or approved equal.

5. Significance and Use

5.1 This practice establishes procedures to ensure that steel fabrication for highway structures is performed in accordance with practices accepted, and understood, by all parties to the contract. The responsibilities of all parties are clearly outlined.

5.2 This document can be incorporated into the contract by reference, or, more appropriately, be the basis for writing the contract special provisions relating to steel fabrication.

5.3 This practice is not meant to serve as a comprehensive specification on quality assurance for all highway structure steel fabrication situations. Customized provisions may have to be developed in conjunction with the procedures outlined herein based on local practices and project specific requirements.

6. Procedural Requirements for a Quality Assurance Plan

6.1 The requirements for a quality assurance plan as noted in Sections 7 and 8 include:

- 6.1.1 Fabricator's quality control plan, and
- 6.1.2 Owner's acceptance testing plan.

6.2 These two plans assume the following functions and responsibilities of the fabricator and the owner:

6.2.1 *The Fabricator*—Prior to fabrication, the fabricator is to have a QCP which is acceptable to the owner. The plan will be in sufficient detail to enable the owner to determine the adequacy of the plan to ensure compliance with the contract plans and specifications.

6.2.2 *The Owner*—The owner will monitor the fabricator's control of the operations to ensure conformity with the contract plans and specifications. At the owner's expense, testing may be performed on materials and the fabricated product to the extent considered necessary to confirm the effectiveness of the fabricator's QCP and to verify acceptability of the finished product.

6.3 At no time will the owner's representatives issue instructions to the fabricator on how to perform the fabrication operations. However, the owner's representatives will question or advise the fabricator against continuation of any operations or sequence of operations observed which may not result in satisfactory compliance with contract plans or specification requirements.

7. Fabricator's Quality Control Plan—(QCP)

7.1 *General Requirements*—The QCP is to be a complete manual detailing the procedures, personnel, policies, equipment and records, including special requirements for unusual structures (for example, fracture critical members, lift bridges, trusses, etc.), to be utilized by the fabricator during planning, ordering, fabrication, painting, and shipping of structural steel items.

7.1.1 The fabricator is to be certified under the American Institute of Steel Construction (AISC) "Quality Certification Program," Category I, II, or III, as appropriate, or equivalent as approved by the owner. If the prospective fabricator is not certified under AISC procedures, the owner may provide for a review of the fabricator's operations prior to acceptance of the fabricator to perform the work. The fabricator will be responsible for the cost incurred by the owner for this review, regardless of whether the fabricator is accepted or not. If the fabricator is not found to possess the capability of providing the quality level desired, it is the contractor's responsibility to engage an acceptable fabricator. Delays in approval to allow this review to take place will not be a basis for time extensions.

7.1.2 For AISC certified plants, the results of the latest AISC evaluation checklist as completed by the AISC inspector, including the results of the latest annual self audit, are to be made available to the owner. Any findings noted in these reports will be resolved prior to fabrication.

7.1.3 For non-certified plants, the findings noted during the review by the owner must be resolved prior to fabrication.

7.2 *Fabricator's Management*—The QCP will show the organizational structure indicating the lines of responsibility for the fabrication process.

7.2.1 The plan will outline the procedures used to ensure that the fabrication is performed utilizing the latest revision of shop drawings, by qualified personnel, using correct procedures.

7.2.2 The engineering and drafting department produces shop drawings to meet the needs of the owner. These