
AISC Certification Program for Structural Steel Erectors

Standard for Structural Steel Erectors—2013

May 30, 2013

Approved by the AISC Certification Standards Committee



AMERICAN INSTITUTE OF STEEL CONSTRUCTION

One East Wacker Drive, Suite 700

Chicago, Illinois 60601-1802

AISC © 2013

by

American Institute of Steel Construction

*All rights reserved. This book or any part thereof
must not be reproduced in any form without the
written permission of the publisher.*

The AISC logo is a registered trademark of AISC.

The information presented in this publication has been prepared in accordance with recognized quality principles and is for general information only. While it is believed to be accurate, this information should not be used or relied upon for any specific application without competent professional examination and verification of its accuracy, suitability and applicability by a competent person. The publication of the material contained herein is not intended as a representation or warranty on the part of the American Institute of Steel Construction or of any other person named herein, that this information is suitable for any general or particular use or of freedom from infringement of any patent or patents. Anyone making use of this information assumes all liability arising from such use.

Caution must be exercised when relying upon other standards and guidelines developed by other bodies and incorporated by reference herein since such material may be modified or amended from time to time subsequent to the printing of this edition. The Institute bears no responsibility for such material other than to refer to it and incorporate it by reference at the time of the initial publication of this edition.

PREFACE

This Preface is not a part of AISC 206-13, *AISC Certification Program for Structural Steel Erectors—Standard for Structural Steel Erectors—2013*, but is intended for informational purposes only.

This Standard was approved by the Certification Standards Committee:

Michael A. West, Chairman	Daniel J. Kaufman
Jack Klimp, Vice Chairman	Andrew Lye
Seth L. Bransky	Gregory F. Rzonca
Henry B. Brummel	Alan T. Sheppard
Jeffrey Dave	Thomas M. Vossmeier
Theodore L. Droessler	Edward P. Wilkas
Charles Johnson	Keith A. Grubb, Secretary
Charles J. Kanapicki	

The Certification Standards Committee gratefully acknowledges the contributions of the Ad Hoc Committee on the Erector Standard:

Alan T. Sheppard, Chairman	Darlaine Taylor
Charles Johnson	Gerald D. Tinsley
Lawrence F. Kruth	Michael A. West
Keith Landwehr	Keith A. Grubb, Secretary
George R. Pocock	

TABLE OF CONTENTS

GLOSSARY	vii
1. SCOPE	1
2. NOT USED	1
3. REFERENCES	1
3.1. General Erection.....	1
3.2. Seismic Erection.....	1
3.3. Metal Deck Installation	1
3.4. Bridge Erection	1
3.5. Safety.....	1
4. NOT USED	1
5. MANAGEMENT RESPONSIBILITY	1
5.1. Policy for Quality	2
5.2. Policy for Safety.....	2
5.3. Periodic Management Review	2
5.4. Responsible Quality and Safety Personnel	2
5.5. Resource Management	3
5.5.1. Personnel.....	3
5.5.2. Erection Tools and Equipment	3
5.6. Quality Management System	3
5.6.1. General Requirements.....	3
5.6.2. Quality Manual	3
5.6.2.1. Organization	3
5.6.2.2. Approval.....	3
5.7. Safety Management System	3
6. CONSTRUCTION DOCUMENT REVIEW AND COMMUNICATION	3
7. NOT USED	4
8. CONTROL OF DOCUMENTS	4
8.1. Quality Management System and Safety Management System Documents	4
8.1.1. Review and Approval.....	4
8.1.2. Revision Control	4
8.1.3. Access	4
8.1.4. Communication.....	4
8.2. Project Documents	4
8.2.1. Receipt	4
8.2.2. Revision Control	4
8.2.3. Access	4
8.2.4. Communication.....	4

TABLE OF CONTENTS (cont'd.)

9. CONTROL OF QUALITY RECORDS	4
9.1. Storage.....	5
9.2. Retrieval	5
9.3. Retention	5
9.4. Disposition	5
10. PURCHASING	5
10.1. Purchasing Data	5
10.2. Selection of Subcontractors and Suppliers.....	5
10.3. Verification of Purchased Product, Materials and Services	5
10.4. Control of Supplied Material	6
11. MATERIAL IDENTIFICATION	6
12. ERECTION PROCESS CONTROL	6
12.1. Welding	6
12.2. Bolt Installation	6
13. INSPECTION	6
14. CALIBRATION OF INSPECTION, MEASURING AND TEST EQUIPMENT	6
15. CONTROL OF NONCONFORMANCES	6
15.1. Nonconformance with the Quality Management System	6
15.2. Nonconforming Work	6
16. CORRECTIVE ACTION	7
17. HANDLING, STORAGE AND DELIVERY OF PRODUCT AND MATERIALS	7
18. TRAINING	7
19. INTERNAL AUDIT	7
20. SAFETY MANAGEMENT SYSTEM	8
20.1. Documentation Requirements.....	8
20.1.1. Safety Manual	8
20.1.2. Erection Plan.....	8
20.1.3. Safety Plan	8
20.1.4. Other Project-Specific Requirements	9
20.2. Safety Training	9

GLOSSARY

The terms listed below are to be used in addition to those in the AISC *Code of Standard Practice for Steel Buildings and Bridges*. Some commonly used terms are repeated here for convenience.

AISC.† American Institute of Steel Construction.

ASTM.† American Society for Testing and Materials.

AWS.† American Welding Society.

Contract documents.† The documents that define the responsibilities of the parties that are involved in bidding, fabricating and erecting structural steel. These documents normally include the design drawings, the specifications and the contract.

Controlling contractor. The prime contractor, general contractor, construction manager, or any other legal entity that has the overall responsibility for the construction of the project—its planning, quality and completion.

Corrective action. The action or actions undertaken to identify and eliminate the root cause of a service or process nonconformance to prevent its recurrence. Corrective action is not the repair or rework of identified nonconforming product or process to meet specified requirements.

Customer. Entity (potentially the general contractor, fabricator, owner, or owner's designated representative for construction) contracting with the erector for the erection of fabricated structural steel.

Design drawings.† The graphic and pictorial portions of the contract documents showing the design, location and dimensions of the work. These documents generally include: plans, elevations, sections, details, schedules, diagrams and notes.

Documentation (documented). Material that provides information or evidence. Documentation may include written instructions, drawings, diagrams, charts, photographs, electronic media, specifications, and references to or excerpts from appropriate technical standards and codes.

Documented procedure. A procedure that is established, documented, implemented and maintained. The documentation provides information about how to perform an activity or process consistently. Documentation shall contain:

- The purpose of the procedure
- Process definition that includes steps required for completion
- Assignment of responsibility for performance

- Assignment of responsibility for review, revision, and/or approval of the procedure
- Identification of records that are generated
- Frequency of observations or inspections and how those observations or inspections are documented

Documented training. Training in which there is a record of the course outline, a record of who attended, the date it was given, and the instructor who provides the training.

Element. A primary section of this Standard as listed in the Table of Contents.

EOR, Engineer, Engineer of record.† See structural engineer of record.

Erection. The process of assembling individual members into a structural steel building or bridge in accordance with all contract documents.

Erection bracing drawings.† Drawings that are prepared by the erector to illustrate the sequence of erection, any requirements for temporary supports and the requirements for raising, bolting and/or welding. These drawings are in addition to the erection drawings.

Erection drawings.† Field-installation or member-placement drawings that are prepared to show the location and attachment of the individual shipping pieces.

Erection plan. The documentation of major resources and activities anticipated to be needed in performance of the work as it is affected by the conditions and requirements of one singular project.

Erector.† The entity that is responsible for the erection of the structural steel.

Executive management. The highest ranking official(s) in the company, e.g., CEO, President, General Manager, Owner, etc. Executive management has full authority in final decision making for all aspects of the quality management system and safety management system.

Fabrication. The process of preparation and assembly of individual parts into a shipping piece in accordance with all contract documents. Fabrication includes all production operations performed in the manufacturing and shipping of the product (e.g., assembly, drilling, sawing, milling, and thermal and mechanical cutting).

Fabricator.† The entity that is responsible for fabricating the structural steel.

† Denotes a term defined in the AISC *Code of Standard Practice for Steel Buildings and Bridges*.

Key position. Executive management and positions in the erector's quality management system that manage purchasing, quality control, erection, project management, and safety functions. Additionally, a key position is any position or function cited in this document as requiring qualification.

MTR. Mill test report as defined in Section 14 of ASTM A6.

Nonconformance. Attributes of materials, consumables, fabricated product (in-process or final), erected members and processes that do not meet contract, regulatory, or erector defined requirements.

NDT. Nondestructive testing.

Objective evidence. Data, records, observations or statements which are verifiable.

Owner.[†] The entity that is identified as such in the contract documents.

Owner's designated representative for construction.[†] The owner or the entity that is responsible to the owner for the overall construction of the project, including its planning, quality and completion. This is usually the general contractor, the construction manager, or similar authority at the job site.

Owner's designated representative for design.[†] The owner or the entity that is responsible to the owner for the overall structural design of the project, including the structural steel frame. This is usually the structural engineer of record.

PQR. Procedure Qualification Record as defined by ANSI/AWS A3.0.

Quality assurance (QA). Monitoring and inspection tasks performed by an agency or firm other than the erector to ensure that the work performed by the erector meets the requirements of the approved construction documents and referenced standards. Quality assurance includes those tasks designated "special inspection" by the applicable building code.

Quality assurance inspection records. Records pertaining to third-party quality assurance functions that are submitted to building officials and others.

Quality control (QC). Controls and inspections implemented by the erector, as applicable, to ensure that the material provided and work performed meet the requirements of the approved construction documents and referenced standards.

Quality control inspector (QCI). Individual designated to perform quality control inspection tasks for the work being performed.

Quality control records. Documents that report the results of inspections mandated by the erector's documented procedures, the project specifications, and industry standards.

Quality manual. A document stating the quality policy and describing the quality management system of the erector's organization.

Quality management system. A system to establish policy, objectives, plans and resources to direct and control an organization with regard to quality.

Quality record. A document that provides objective evidence of activities performed or results achieved.

RCSC. Research Council on Structural Connections.

RFI.[†] A written request for information or clarification generated during the construction phase of the project.

Safety management system. A system to establish policy, goals, plans and resources to identify and document hazards and their elimination, mitigation or isolation related to the safety and health of employees and third parties, and to eliminate property and equipment damage that may be caused by unsafe acts or unsafe conditions.

Safety manual. A document stating the safety policy and describing the safety management system of the erector's organization.

Safety plan. The identification and documentation of specific hazards related to a singular project and the means and methods to be used to eliminate, mitigate or isolate those hazards.

Shipping piece. Individual member for field erection carrying a specific identification mark.

Shop drawings.[†] Drawings of the individual structural steel shipping pieces that are to be produced in the fabrication shop.

Specifications.[†] The portion of the contract documents that consists of the written requirements for materials, standards and workmanship.

SSPC.[†] SSPC: The Society for Protective Coatings, which was formerly known as the Steel Structures Painting Council.

Steel detailer.[†] The entity that produces the shop drawings and erection drawings.

[†] Denotes a term defined in the AISC *Code of Standard Practice for Steel Buildings and Bridges*.

Structural engineer of record.[†] The licensed professional who is responsible for sealing the contract documents, which indicate that he or she has performed or supervised the analysis, design, and document preparation for the structure and has knowledge of the load-carrying structural system.

Structural steel.[†] Elements of the structural frame as given in Section 2.1 of the AISC *Code of Standard Practice*.

Subcontractor. A firm that performs a portion of the erector's contract work such as fabrication, detailing, coating application, inspection or consulting services.

Supplier. A firm that supplies materials (including but not limited to: mill materials, process supplies, welding consumables, coatings and process machinery) and completed purchased product (including but not limited to: fasteners, decking, joists and proprietary buy-out items) needed to fulfill the erector's contract requirements.

WPS. Welding procedure specification as defined by ANSI/AWS A3.0.

[†] Denotes a term defined in the AISC *Code of Standard Practice for Steel Buildings and Bridges*.

1. SCOPE

This Standard describes the requirements of a quality management system and safety management system for structural steel erectors. The quality management system shall address all functions of structural steel erection from receipt of contract through completion of the work of the erector.

Commentary:

The quality and safety requirements of this Standard are not intended to be a representation or warranty on the part of the American Institute of Steel Construction regarding performance of the work or compliance with safety regulations. It is the responsibility of the erector to comply with all federal, state and local regulations. It is the responsibility of the erector to maintain current editions of all reference documents and regulations incorporated into this standard as well as any replacement or additional references that become relevant subsequent to the initial publication of this Standard.

2. NOT USED

3. REFERENCES

The erector shall provide and maintain appropriate versions of reference materials relating to the general nature of the work. Reference materials shall include any specialized documents necessary to be consistent with current contracts.

Reference materials shall be readily available to employees and others who need them.

3.1. General Erection

The erector shall have available and demonstrate the ability to work to and meet the requirements of:

- ANSI/AISC 360 *Specification for Structural Steel Buildings*
- AISC 303 *Code of Standard Practice for Steel Buildings and Bridges*
- RCSC *Specification for Structural Joints Using High-Strength Bolts*
- AWS D1.1 *Structural Welding Code—Steel*

Commentary:

Other reference documents that may be required or needed are as follows:

- AWS D1.3 *Structural Welding Code—Sheet Steel*
- AISC *Selected ASTM Standards for Structural Steel Fabrication*
- AWS A2.4 *Symbols*
- AWS A3.0 *Terms and Definitions*
- ANSI/ASSE A10.13 *Safety Requirements for Steel Erection*

- SSPC *Steel Structures Painting Manual, Volume I, Good Painting Practice*
- SSPC *Steel Structures Painting Manual, Volume II, Systems and Specifications*
- AISC *Detailing for Steel Construction*

3.2. Seismic Erection

For the erection of structures requiring the use of ANSI/AISC 341, *Seismic Provisions for Structural Steel Buildings*, the erector shall have available and demonstrate the ability to work to and meet the requirements of:

- ANSI/AISC 341 *Seismic Provisions for Structural Steel Buildings*
- AWS D1.8 *Structural Welding Code—Seismic Supplement*

3.3. Metal Deck Installation

When the erector's work includes the installation of metal deck, the erector shall have available and demonstrate the ability to work to and to meet the requirements of ANSI/SDI *QA/QC Standard for Quality Control and Quality Assurance for Installation of Steel Deck*. Instructions for metal deck installation shall be provided in the erection plan and the safety plan.

3.4. Bridge Erection

For the erection of bridges, the erector shall have available and demonstrate the ability to work to and meet the requirements of AWS D1.5, *Structural Welding Code—Bridge Welding Code*.

3.5. Safety

The erector shall provide access to OSHA Part 1926 *Safety and Health Regulations for Construction* or the appropriate state equivalent to employees and others who require access.

4. NOT USED

5. MANAGEMENT RESPONSIBILITY

Executive management shall define, document and adopt a commitment to quality and safety. Executive management shall direct and lead the erector to ensure continuous progress towards achieving these commitments.

Executive management is responsible for developing and maintaining a quality management system and a safety management system to meet the requirements of this Standard and the requirements of the approved construction documents and referenced standards. Executive management shall manage the functions detailed in Elements 5 through 20 of this Standard.

Commentary:

Executive management should ensure that appropriate communication processes are established within the erector's organization and that communication takes place regarding the effectiveness of the quality management system and safety management system as part of their continuing maintenance.

5.1. Policy for Quality

The policy for quality shall include:

- a. A commitment to quality that includes a commitment to meet contract requirements.
- b. A quality management system that provides a framework for establishing, communicating and reviewing quality goals of the erector's organization.
- c. A commitment to training.

Executive management shall establish goals to improve quality. Goals must be measurable and documented through objective evidence.

As quality goals are achieved, new goals shall be set that demonstrate commitment to continuous improvement. New goals can be a new level of achievement of a previous goal, or a new goal that has not been previously identified.

Executive management shall ensure that the company's policy for quality is understood, implemented and maintained.

5.2. Policy for Safety

The policy for safety shall include:

- a. A commitment to safety that includes at a minimum a commitment to meet federal and/or state requirements for construction safety.
- b. A safety management system that provides a framework for establishing, communicating and reviewing safety goals of the erector's organization.
- c. A commitment to safety training.

Executive management shall establish safety goals. Goals must be measurable and documented through objective evidence.

As safety goals are achieved, new goals shall be set that demonstrate commitment to continuous improvement. New goals can be a new level of achievement of a previous goal or a new goal that has not been previously identified.

Executive management shall ensure that the company's policy for safety is understood, implemented and maintained.

5.3. Periodic Management Review

Executive management is responsible for periodic review of the erector's quality management system and safety management system at planned intervals, but annually at a minimum.

Records from management reviews shall be maintained according to the erector's record retention policy.

The management review shall encompass the following, at a minimum.

- a. A brief summary of applicable previous management reviews.
- b. Results of any internal and external audits conducted since the previous management review.
- c. An assessment of customer feedback and feedback mechanisms, identifying opportunities for improving service quality.
- d. An assessment of erected steel nonconformances. Both the number and the severity of nonconformances shall be assessed.
- e. An assessment of the erector's compliance with the documented procedures comprising the quality management system or safety management system.
- f. An assessment of the results of equipment inspections, including the adequacy of equipment resources.
- g. An assessment of the adequacy of the erector's training program with respect to the levels of qualification required.
- h. An assessment of any proposed or required modifications to the quality management system and safety management system.

5.4. Responsible Quality and Safety Personnel

Executive management shall designate management representatives for quality and safety who shall report directly to (or be a part of) executive management.

The designated management representatives for quality and safety may perform other functions within the company, provided that those functions do not conflict with the quality and safety responsibilities.

The designated management representative(s) shall have the ability, responsibility and authority to:

- a. Ensure that documented procedures needed for the quality and safety management systems are established, implemented and maintained in accordance with this Standard.
- b. Report to executive management on the performance of the quality management system and safety management system and any need for improvement.
- c. Communicate with external parties on matters relating to the quality management and safety management systems.

- d. Promote the awareness of customer quality and safety requirements throughout the erector's organization.

5.5. Resource Management

The erector shall have the resources necessary to comply with the contract documents. Resources shall include, but are not limited to, the resources described below.

5.5.1. Personnel

Personnel performing defined functions shall have the required qualifications and the ability to successfully perform the function. Objective evidence of qualification may be demonstrated through biographies, resumes, documented training, and individual licenses or certifications.

Personnel may be assigned to more than one function, provided they are qualified and able to perform fully the duties of each position.

5.5.2. Erection Tools and Equipment

The erector shall have under their control the tools and equipment necessary to perform the work. Equipment must be maintained at the level necessary to produce the required quality.

5.6. Quality Management System

5.6.1. General Requirements

The quality management system shall satisfy all of the requirements of this Standard and the requirements of the approved construction documents and referenced standards.

The quality management system shall include a quality manual, documented procedures and records as required by this Standard.

Requirements may be satisfied in a single document called the quality manual which may incorporate separate documents by reference.

Commentary:

The extent of the quality management system documentation can differ from one organization to another due to the size of organization, the type of activities, and the complexity and interaction of processes.

5.6.2. Quality Manual

The quality manual shall contain the following:

- a. Documented statements of a quality policy and quality objectives as required by this Standard.

- b. Documented procedures established for the quality management system (or references to them), along with their associated quality records.
- c. Documents needed by the organization to ensure the effective planning, operation, and control of its processes.
- d. Organizational chart describing the interrelationship of functional positions that manage, perform, and verify work affecting quality.
- e. Job descriptions outlining responsibilities, authority and required qualifications for key positions.
- f. Qualification evidence and biographies for individuals in key positions/functions.
- g. Equipment list.

Executive management shall define additional documented procedures, drawings or other documents that are required beyond the minimum requirements set by this Standard to meet the needs of the erector's organization and its customers.

Commentary:

The erector's management determines the level of detail in the quality manual and procedures. At a minimum, these documents should be detailed enough to adequately describe the quality management system used by the erector to assure the end work meets the required quality.

5.6.2.1. Organization

The quality manual shall include a page showing the current revision date and the name and address of the erector.

5.6.2.2. Approval

The highest ranking member of executive management shall sign and date the quality manual.

5.7. Safety Management System

See Element 20.

6. CONSTRUCTION DOCUMENT REVIEW AND COMMUNICATION

The erector shall develop a documented procedure for contract and project specification review requiring completion of these reviews for each project performed. The review shall begin no later than the erector's acceptance of responsibility for performing the work.

Commentary:

The review should identify, plan for and record the specific project requirements.

The documented procedure should provide for review of the construction documents and referenced standards to ensure that the erector is fully aware of the contract requirements.

Evidence of contract review may take the form of technical summaries, signoffs, schedules, and allocation of adequate resources, as well as development of an erection plan and a safety plan (see Element 20).

Such evidence should indicate consideration of pertinent elements of this Standard managed by the functions listed in Section 5.4 and other critical project requirements that, if missed, will have a major impact on project quality.

7. NOT USED

8. CONTROL OF DOCUMENTS

The erector shall develop documented procedures to control documents related to the quality management system and safety management system.

The erector shall also develop documented procedures to control project documents.

8.1. Quality Management System and Safety Management System Documents

Documents covered by this section shall include, but not be limited to, the quality manual, the safety manual, and any documented procedures.

8.1.1. Review and Approval

Documents shall be reviewed and approved by the same function and authority level that authorized the original document.

8.1.2. Revision Control

Revisions shall be clearly identifiable and there shall be a method for monitoring and identifying the latest revision.

Revisions shall be reviewed for adequacy and approved by the same function and authority level that authorized the original document.

Documents shall be legible.

8.1.3. Access

Documents shall be available and readily accessible to all personnel responsible for performing functions affecting the quality of the completed work and all personnel affected by the safety management system.

8.1.4. Communication

Changes and revisions shall be clearly communicated to all personnel responsible for performing functions affecting the quality of the completed work and all personnel affected by the safety management system.

8.2. Project Documents

Documents covered by this section shall include, but not be limited to, contract documents, revised contract documents, shop drawings, erection drawings, RFIs, and quality assurance reports.

8.2.1. Receipt

Contract documents and changes to the contract documents, including but not limited to revised contract documents, change orders, and RFIs, shall be tracked in an orderly manner.

Tracking information shall indicate, at a minimum, date of receipt, summary of issue, and ultimate disposition of the change.

8.2.2. Revision Control

The documented procedure shall include provisions to prevent inadvertent use of obsolete documents. Revisions shall be clearly identifiable and there shall be a method for monitoring and identifying the latest revision.

Documents shall remain legible.

8.2.3. Access

Documents shall be available and readily accessible to all personnel responsible for performing functions affecting the quality of the completed work and all personnel affected by the safety management system.

8.2.4. Communication

A transmittal system shall be established to record the distribution of information to personnel, subcontractors and suppliers. Transmittals shall indicate the status of approval and release for erection.

9. CONTROL OF QUALITY RECORDS

The erector shall develop documented procedures for the control of quality records, including quality control records and quality assurance inspection records, that provide for record identification, storage, retrieval, retention and disposition.

All quality control records, including records of final inspections, shall be reviewed by the quality control inspector.

Commentary:

Quality records commonly include items such as:

- Certificates of conformance
- Corrective action requests
- Drawing logs
- Equipment maintenance records
- Inspection records
- Internal and external quality management system and safety management system audits
- Mill and consumable purchase orders
- MTRs
- NDT reports
- Records or summaries of nonconformance reports
- Revisions to the contract documents
- RFIs
- Subcontractor and supplier evaluations
- Training records

9.1. Storage

Quality records shall be stored in a manner that minimizes damage, deterioration or loss.

9.2. Retrieval

Quality records shall be accessible in a reasonable time frame.

9.3. Retention

Quality records shall be subject to an established retention policy. The retention period will be, at a minimum, through the acceptance of the work described in Section 7.13.3 of the AISC *Code of Standard Practice*.

9.4. Disposition

The documented procedure for the control of quality records shall contain provisions for the disposition of the records at the end of the retention period.

10. PURCHASING

The erector shall develop documented procedures to ensure that subcontractors and suppliers provide contracted services and materials conforming to project requirements.

10.1. Purchasing Data

The erector shall clearly describe subcontracted work and the purchased materials, and services ordered in written purchasing documents. This shall include but not be limited to:

- a. The type of service, material, class, grade, and other unique identification.
- b. The applicable specifications, drawings, process requirements, and inspection instructions and any witness points.

- c. Delivery instructions and date.
- d. Required quality reports, certified test reports, and certificates of compliance/conformance of purchased materials.
- e. Safety Data Sheets

Commentary:

Purchasing documents for materials furnished to ASTM specifications should include the information required in the “Order Information” section of the ASTM Standard. Because OSHA does not require manufacturers to fully transition to Safety Data Sheets (SDS) prior to December 1, 2015, Material Safety Data Sheets (MSDS) may remain in common use until that time.

10.2. Selection of Subcontractors and Suppliers

The erector shall evaluate and select subcontractors and suppliers on the basis of their ability to meet subcontract requirements, the erector’s quality management system, the requirements of this Standard, and the requirements of the approved construction documents and referenced standards.

The erector shall develop a documented procedure that describes how the erector conducts initial and ongoing evaluation of all subcontractors and suppliers.

Management shall determine:

- a. Evaluation criteria.
- b. Reevaluation interval.
- c. Personnel involved in the evaluation process.

The erector shall evaluate subcontractors and suppliers via an audit or documented acceptable past experience. As a minimum, quality of the final products and timely, proper delivery of services or products shall be part of the evaluation.

Commentary:

AISC Certified Steel Fabricators and AISC Certified Steel Erectors meet these requirements.

10.3. Verification of Purchased Product, Materials and Services

The erector shall establish and implement the inspection or other activities necessary for ensuring that purchased products, materials and services meet project requirements.

Purchasing documents, subcontractor and supplier qualification records, and records of the periodic evaluation of subcontractors and suppliers shall be maintained as indicated in Element 9.

10.4. Control of Supplied Material

If materials are supplied by others, the erector shall verify, store and maintain materials in an appropriate fashion. Verification shall include confirmation that the material meets the requirements of the approved construction documents and referenced standards. Supplied material shall be protected to prevent use for other than its intended purpose. Any such product that is lost, damaged, or is otherwise unsuitable for use shall be recorded and reported as appropriate.

11. MATERIAL IDENTIFICATION

The erector shall develop a documented procedure for identification of materials purchased by the erector.

Records that provide a basis for material identification shall be maintained as defined for quality control records by Element 9.

Commentary:

MTRs, manufacturers' test reports, certificates of conformance for base materials, bolts, welding consumables, and coatings provide material identification. In the absence of specific contract requirements, these records usually constitute sufficient evidence that the product satisfies material order requirements.

12. ERECTION PROCESS CONTROL

The erector shall develop documented procedures for erection processes necessary to produce a consistent acceptable level of quality of the completed work in accordance with applicable codes and project requirements.

12.1. Welding

The erector's documented procedures for welding shall meet the requirements of AWS and the requirements of approved construction documents and referenced standards.

12.2. Bolt Installation

The erector's documented procedures for bolting shall meet the requirements of the RCSC *Specification for Structural Joints Using High-Strength Bolts* and the requirements of approved construction documents and referenced standards.

13. INSPECTION

The erector shall develop a documented procedure for inspection activities to verify that the completed work meets the requirements of the approved construction documents and referenced standards.

The documented procedure shall be consistent with Chapter N of the AISC *Specification for Structural Steel Buildings*.

14. CALIBRATION OF INSPECTION, MEASURING AND TEST EQUIPMENT

The erector shall establish a documented procedure to calibrate its inspection, measuring and testing equipment.

The documented procedure shall include provisions for:

- a. A unique identifier for each piece of equipment
- b. An equipment list
- c. Calibration or adjustment instructions in accordance with the manufacturer's recommendations
- d. Frequency of calibration or adjustment
- e. Tracking calibrations, adjustments and repairs
- f. Storage and handling

Calibration or adjustment history shall be available.

Rented or borrowed equipment must be accompanied by a valid calibration certificate and is subject to the requirements of this Element.

For equipment that is damaged, dropped, knocked over or functioning improperly, the documented procedure shall include provisions for prominently marking or tagging such equipment to preclude usage and removing the equipment from service until it can be re-calibrated, adjusted or repaired.

The precision required of any piece of equipment shall be sufficient to satisfy the acceptance standards of the project specifications or industry standards.

15. CONTROL OF NONCONFORMANCES

The erector shall develop a documented procedure to identify and control nonconformances. These nonconformances may be identified by the erector's quality management system, during external audits, or by quality assurance inspections.

15.1. Nonconformance with the Quality Management System

A nonconformance related to the performance of the quality management system shall be documented to the detail level described by the documented procedure.

15.2. Nonconforming Work

The documented procedure for nonconforming work shall provide for identification, documentation, evaluation, treatment of nonconforming work, and notification of the relevant functions concerned. Nonconforming work may also be identified in a quality assurance inspection report. These reports, when received, become quality assurance inspection records. The erector's procedure shall pro-

vide for the disposition of quality assurance inspection records.

Nonconforming work shall be clearly marked as soon as practical after it is discovered. Records shall be kept of the pieces affected, the nature of the nonconformance, the treatment selection, authorization, and re-inspection results if applicable.

The treatment of nonconforming work may include:

- a. Redesign and rework, as approved.
- b. Repair, as approved.
- c. Use as-is, as approved.
- d. Scrap.

If the treatment is rework or repair, the result will be inspected per project requirements, as well as the erector's quality control process. Correction of minor misfits as defined in Section 7.14 of the AISC *Code of Standard Practice* does not constitute nonconforming work.

16. CORRECTIVE ACTION

The erector shall develop a documented procedure for corrective action. Any corrective action taken shall be to the degree appropriate to the magnitude of problems and commensurate with the risks to erection quality and safety.

The documented procedure shall include periodic review of records or summaries of nonconformances and of internal and external quality and safety audit reports for determination and initiation of corrective actions.

Corrective action shall be applied when:

- a. There is a nonconformance that is repetitive in nature as identified by periodically reviewing nonconformance reports or summaries for negative trends.
- b. Process nonconformances are found during the internal and external quality and safety audits indicating that the quality management system or safety management system may not be implemented and functioning as stated in the quality manual or safety manual.
- c. Nonconformance with the quality management system or safety management system is found during the day-to-day execution of the system.
- d. Nonconformance is unacceptable due to cost or severity.
- e. A customer complaint has been received.

The corrective action procedure shall address these steps:

1. Document a corrective action request (CAR) that includes the nonconformance to be addressed by the corrective action and the requirement that has not been met. The corrective action procedure shall define the functional positions authorized to issue a CAR and initiate the corrective action process.

2. Assign responsibility and establish a time frame for the response to a CAR.
3. Investigate and document the scope of the nonconformance, root causes, corrective measures taken, and list the actions to be taken to prevent recurrence.
4. Communicate the corrective action request and resolution to the management team and appropriate members of the organization.
5. Follow up the corrective action taken with periodic monitoring to assure the corrective action is implemented and is effective.

17. HANDLING, STORAGE AND DELIVERY OF PRODUCT AND MATERIALS

Material shall be stored to avoid damage and deterioration as required by the AISC *Code of Standard Practice*.

Material shall be protected to prevent use in other than its intended purpose. Any such material that is lost, damaged, or is otherwise unsuitable for use shall be recorded and reported as appropriate.

18. TRAINING

Personnel responsible for functions that affect quality or safety, including but not limited to, project managers, inspectors, welding personnel, riggers, signal persons and crane operators, shall receive appropriate initial and periodic documented training. Training records are quality records controlled as required in Element 9.

Personnel providing training shall have appropriate training or experience in the subject they are teaching. Training course outlines include the subject and the key points.

Refer to Element 20 for safety-related training.

19. INTERNAL AUDIT

The erector shall perform an internal audit of each element of the quality management system and safety management system at least once a year to evaluate their compliance and the effectiveness of implementation. Different parts of the quality management system and safety management system may be audited at different times and different frequencies, as long as all elements of the quality management system and safety management system are audited annually. Audits shall be scheduled based on the importance of the area being audited.

The management representative for quality or for safety or a qualified individual, independent of the function being audited, shall perform the audit and produce a written record of the audit result from each Element.

20. SAFETY MANAGEMENT SYSTEM

20.1. Documentation Requirements

20.1.1. Safety Manual

The safety manual shall contain the following information at a minimum:

- a. Safety policy statement
- b. Identification of the individual responsible for the safety management system.
- c. Safety and health inspections
- d. Incident investigation
- e. Hazard prevention and control
- f. Safety and health training
- g. Personal protective equipment
- h. Hazard communication
- i. Lockout/tag out procedure
- j. Respiratory protection
- k. Fall protection

20.1.2. Erection Plan

The erector shall prepare an erection plan for every project. The erection plan, in whole or in part, may be described graphically or in text. The erection plan shall include the following information as appropriate for the project:

- a. Project name and location.
- b. Indication of access for material delivery and equipment delivery, including lay-down, shake-out, and field-assembly areas.
- c. Sequence of erection.
- d. Dimensions and locations of cranes or other lifting equipment.
- e. Required site conditions for the crane location and confirmation of adequate base support for the crane.
- f. Sizes, model names or numbers, and capacity charts for lifting equipment.
- g. Information regarding the heaviest lift and its radius; the longest radius and its lift weight; and the boom configuration for each at every location of the lifting equipment.
- h. Indicate critical lifts, if any, and include the critical lift protocol or procedure
- i. Requirements for multi-lift rigging.
- j. Types of slings to be used and, if more than one type, the locations in which they will be used.
- k. Rigging information for atypical lifts (weight, geometry, center of gravity, etc.) such as slings and hardware, rated lifting beams, beam clamps (including catalog cuts), as applicable to the lift.

- l. Designation of crane paths from position to position, indicating load travel paths, swing restrictions, and personnel exclusion zones.
- m. Designation of space required for field assembly prior to erection.
- n. Identification of special fastening sequences and/or methods.
- o. Identification of special or atypical connections.
- p. Traffic control notes.
- q. Identification of specification requirements for erection, such as plumbing tolerances smaller than those stipulated in the AISC *Code of Standard Practice*.
- r. The stability of the structure and individual members during erection shall be checked in accordance with the AISC *Code of Standard Practice* Section 7.10.3.
- s. Falsework requirements and corresponding design calculations.
- t. Jacking layout and jacking procedure
- u. Notation of special problems due to overhead restrictions, underground utilities, barriers to crane tail swing, etc.
- v. Documentation covering welding and bolting QCI qualifications in Chapter N of the AISC *Specification for Structural Steel Buildings and Bridges*.

The erection plan shall be reviewed before the start of erection by the erector's project management team and be available to all employees assigned to the project. All revisions shall be approved by the site superintendent and communicated to affected personnel at the time of the revision.

20.1.3. Safety Plan

The erector shall prepare a safety plan for every project. The safety plan may be combined with the erection plan only when the erection plan has been prepared in text format.

A safety plan shall consider known or reasonably anticipated hazards relating to the project site and construction activities. The safety plan shall include a pre-task analysis for each steel erection activity that occurs on the project site, a list of all hazardous materials on the project site, an emergency evacuation plan, and requirements for regularly scheduled safety inspections.

The safety plan shall include the following information as appropriate for the project:

- a. Project name and location.
- b. The erector's emergency contacts on-site and off-site.

- c. Fall protection requirements that differ from those in the safety manual.
- d. Required personal protective equipment.
- e. Protection for openings and perimeters.
- f. Special procedures required, such as but not limited to, lockout/tagout, confined space training and lead exposure mitigation.
- g. Special training required.
- h. Medical services available on site, contact information for emergency services, and emergency evacuation procedures.
- i. Employee drug-testing requirements.
- j. Requirements for work attire.

The safety plan shall be reviewed before the start of erection by the erector's project management team and be available to all employees assigned to the project. All revisions shall be approved by the individual responsible for the safety management system and communicated to affected personnel at the time of the revision.

Commentary:

The safety plan is an integral component of the safety training described in Section 20.2.

20.1.4. Other Project-Specific Requirements

In accordance with OSHA Subpart R, the AISC *Code of Standard Practice*, and contract documents, prior to the start of erection the erector shall have documentation or other evidence that required site conditions have been met.

Commentary:

The specific requirements are found in OSHA Subpart R 1926.752 a, b and c; OSHA 1926.755 b; and the AISC *Code of Standard Practice* Sections 7.2 and 7.3.

In accordance with the AISC *Code of Standard Practice* and contract documents, the erector shall have documentation or other evidence that the required information in the AISC *Code of Standard Practice* Section 7.10 has been provided.

20.2. Safety Training

Safety training shall include weekly safety training talks and an initial safety orientation for each employee.

Safety training shall include the requirements of OSHA 1926 as applicable.

Commentary:

The safety plan described in Section 20.1.3 is an integral component of safety training.

OSHA provides minimum requirements for training in the following Subparts:

- a. General Safety and Health Provisions (OSHA Subpart C)
- b. Occupational Health and Environmental Controls (OSHA Subpart D)
- c. Hazard Communication
- d. Personal Protective and Life Saving Equipment (OSHA Subpart E)
- e. Respiratory protection
- f. Fire Protection and Prevention (OSHA Subpart F)
- g. Signs, Signals and Barricades (OSHA Subpart G)
- h. Tools—Hand and Power (OSHA Subpart I)
- i. Welding and Cutting (OSHA Subpart J)
- j. Electrical (OSHA Subpart K)
- k. Scaffolding (OSHA Subpart L)
- l. Fall Protection (OSHA Subpart M)
- m. Motor Vehicles, Mechanized Equipment and Marine Operations (OSHA Subpart O)
- n. Steel Erection (OSHA Subpart R)
- o. Connector Training
- p. Multiple Lift Rigging Training
- q. Stairways and Ladders (OSHA Subpart X)
- r. Toxic and Hazardous Substances (OSHA Subpart Z)
- s. Cranes and Derricks in Construction (OSHA Subpart CC)
- t. Aerial lift Training
- u. Qualified Rigger Training
- v. Qualified Signal Person Training
- w. Certified Crane Operator Training

It is the responsibility of the erector to maintain current editions of all reference documents and regulations incorporated into this standard as well as any replacement or additional references that become relevant subsequent to the initial publication of this Standard.



AMERICAN INSTITUTE OF STEEL CONSTRUCTION

One East Wacker Drive, Suite 700, Chicago, Illinois 60601

312.670.2400 www.aisc.org

AISC 206-13