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ACCREDITATION CRITERIA FOR FABRICATOR INSPECTION PROGRAMS FOR STRUCTURAL STEEL

AC172

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PREFACE

The attached accreditation criteria have been issued to provide all interested parties with guidelines on implementing performance features of the applicable standards referenced herein. The criteria were developed and adopted following public hearings conducted by the International Accreditation Service, Inc. (IAS), Accreditation Committee and are effective on the date shown above. All accreditations issued or reissued on or after the effective date must comply with these criteria. If the criteria are an updated version from a previous edition, solid vertical lines (|) in the outer margin within the criteria indicate a technical change or addition from the previous edition. Deletion indicators (→) are provided in the outer margins where a paragraph or item has been deleted if the deletion resulted from a technical change. These criteria may be further revised as the need dictates.

IAS may consider alternate criteria provided the proponent submits substantiating data demonstrating that the alternate criteria are at least equivalent to the attached criteria and otherwise meet applicable accreditation requirements.

ACCREDITATION CRITERIA FOR FABRICATOR INSPECTION PROGRAMS FOR STRUCTURAL STEEL

1. INTRODUCTION

1.1. **Scope**: These criteria set forth the requirements for obtaining and maintaining International Accreditation Service, Inc. (IAS), Fabricator Inspection Programs for Structural Steel accreditation. These criteria supplement the IAS Rules of Procedure for Accreditation of Fabricator Inspection Programs.

1.2. **Overview**: Accredited entities complying with these criteria will have demonstrated they have the personnel, organization, experience, knowledge, quality procedures and commitment to fabricate in accordance with specified requirements. IAS-accredited inspection programs for manufacturers of metal building systems operate under a documented management system developed in concert with IAS-accredited inspection agency which conducts unannounced inspections to verify continued compliance with these criteria. The management system includes the manufacturer's written fabrication procedures and quality control manuals which provide a basis for control of materials and workmanship, with periodic inspections of fabrication and quality control practices by an IAS-accredited inspection agency. Although accredited entities are evaluated on their performance measures to consistently produce products of the required quality mandated by specified requirements, these criteria do not cover the products or the design or performance characteristics of the products.

1.3. **Normative and Reference Documents**: Publications listed below refer to current editions (unless otherwise stated).

1.3.1. International Building Code®, published by the International Code Council.

1.3.2. IAS Rules of Procedure for Accreditation of Fabricator Inspection Programs.

1.3.3. American Welding Society: D1.1, D1.3, D1.4, AASHTO/AWS D1.5 and D1.8 Structural Welding Code.

1.3.4. American Welding Society: A2.4, Standard Symbols for Welding, Brazing, and Nondestructive Examination.

1.3.5. American Welding Society: A3.0, Standard Welding Terms and Definitions Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying.

1.3.6. American Welding Society: QC1, Standard for AWS Certification of Welding Inspectors.

1.3.7. Canadian Standards Association: W178.2, Certification of welding inspectors.

1.3.8. The Society for Protective Coatings (SSPC):

1.3.8.1. SSPC Painting Manual, Volume 1, Good Painting Practice.

1.3.8.2. SSPC Painting Manual, Volume 2, Systems and Specifications.

1.3.9. Research Council on Structural Connections: RCSC – Specification for Structural Joints Using ASTM A325 or A490 Bolts.

1.3.10. ISO 9606-1, Qualification testing of welders – Fusion welding – Part 1: Steels.

1.3.11. The American Society for Nondestructive Testing (ASNT): SNT-TC-1A Personnel Qualification and Certification in Nondestructive Testing.

1.3.12. American Institute of Steel Construction (AISC), ANSI/AISC 360 Specification for Structural Steel Buildings.

1.3.13. American Iron and Steel Institute: AISI S100: North American Specification for the Design of Cold-Formed Steel Structural Members.

2. DEFINITIONS

For the purposes of these accreditation criteria, the definitions given in the ISO/IEC Standard 17000 series, and the definitions that follow, apply.

2.1. **Approved Fabricator**: An established and qualified person, firm or corporation approved by the building official pursuant to the *International Building Code*®, published by the International Code Council.

2.2. **Contract Documents**: Documents that describe the fabricator's responsibilities for a given project. These documents include work orders, drawings, and project specifications.

2.3. **Corrective Action**: Implemented action of solutions necessary to eliminate or reduce the root cause of an identified problem.

2.4. **DAR (Designated Accreditation Representative)**: A quality professional, designated by the fabricator who has demonstrated competence in managing and implementing a management system with consistent results.

2.5. **DARD (Designated Accreditation Representative Deputy)**: An employee designated by the fabricator who has demonstrated competence in managing and implementing the fabricator's management system during a temporary absence of the DAR.

Note: Reference Appendix A of AC172 for the requirements of the Designated Accreditation Representative.

2.6. **Management System**: A set of interrelated or interacting elements that organizations use to direct, control and coordinate how policies are implemented and objectives are achieved. Previously, this was referred to as Quality System.

2.7. **Nonconformance**: An action employed that renders a member or component unacceptable for the intended use as specified in contract specifications or these criteria.

2.8. **Nondestructive Testing (NDT)**: The process of inspecting, testing, or evaluating materials, components or assemblies for discontinuities, or differences in characteristics without destroying the serviceability of the part or system.

2.9. **PQR**: Procedure Qualification Record in accordance with AWS or AASHTO/AWS Standards, as applicable.

2.10. **Procedure**: An implemented and written document that describes who does what, when, where, why and how.

2.11. **Product**: Result of activities or processes.

2.12. **Project**: A process consisting of a set of coordinated and controlled activities undertaken to achieve customer requirements.

2.13. **Quality Assurance**: Measurable systematic actions to assure confidence that the implementation of planned activities result in meeting objectives, goals and project specifications.

2.14. **Quality Control**: The act of examination, testing or measurement that verifies processes, services or that documents conform to specified criteria.

2.15. **Quality Plan**: A written document prepared by the designated accreditation representative that describes the procedures and policies implemented to assure product quality meets specific contract documents. As a minimum, quality plans must meet the requirements of AC172.

2.16. **Repair**: Action taken to render a member or component acceptable for the intended use.

2.17. **Scope of Accreditation**: Specific conformity assessment services for which accreditation is sought or has been granted.

2.18. **Specification**: A document that states the obligatory requirements the product must conform to.

2.19. **Steel Construction, Cold-formed**: That type of construction made up entirely or in part of steel structural members cold formed to shape from sheet or strip steel such as roof deck, floor and wall panels, studs, floor joists, roof joists and other structural elements.

2.20. **Steel Element, Structural**: Any steel structural member of a abuilding or structure consisting of rolled shapes, pipe, hollow structural sections, plates, bars, sheets, rods or steel castings other than cold-formed steel or steel joist members.

2.21. **Steel Joist**: Any steel structural member of a building or structure made of hot-rolled or cold-formed solid or open-web sections, or riveted or welded bard strip or sheet steel members, or slotted and expanded, or otherwise deformed rolled sections.

2.22. **WPS**: Welding Procedure Specification in accordance with American Welding Society D1.1, D1.3, D1.4, or AASHTO/AWS D1.5, and D1.8 as applicable.

3. ELIGIBILITY

Accreditation services are available to structural steel fabrication inspection program facilities that meet the requirements of these criteria.

4. REQUIRED BASIC INFORMATION

4.1. Fabricator inspection programs for structural steel must demonstrate compliance with the following requirements:

4.1.1. The requirements of these accreditation criteria;

4.1.2. IAS Rules of Procedure for Accreditation of Fabricator Inspection Programs.

4.2. **General Requirements**

4.2.1. **Quality System**

4.2.1.1. The fabricator shall establish and implement a management system that is fully documented. This documented management system must describe the fabricator's procedures and quality activities for ensuring that fabricated products meet the specified requirements of these criteria.

4.2.1.2. The fabricator in concert with an IAS-accredited inspection agency, shall prepare and submit to IAS its documented management system, including a cross-reference matrix ensuring that the general requirements in Section 4.2, data in Section 4.3, the statements in Section 4.4, and the written procedures noted in Section 4.5 of these accreditation criteria have been included.

4.2.1.3. The submitted management system document must be signed and dated by the highest level of authority within the organization.

4.2.1.4. The submitted management system document must be signed and dated by an authorized representative of an IAS-accredited inspection agency, attesting that the inspection agency has reviewed the fabricator's documented management system and that the fabricator's documented management system is sufficient to schedule an onsite joint assessment with IAS.

4.2.2. **Designated Accreditation Representative**: The fabricator shall designate a Designated Accreditation Representative who has the necessary training and experience to complete the tasks listed in Sections 4.2.2.1. through 4.2.2.5. The Designated Accreditation Representative shall report directly to the highest level of authority within the organization. The Designated Accreditation Representative shall have the following responsibilities:

Note: Responsibilities noted in Sections 4.2.2.1. through 4.2.2.5. may be delegated to individuals such as a quality manager, where appropriate.

4.2.2.1. Maintaining the fabricator's documented management system in accordance with these criteria.

4.2.2.2. Monitoring the effective implementation of the fabricator's documented management system and reporting the results to the highest level of authority annually.

4.2.2.3. Assuring that, as a minimum, annual internal audits are conducted and documented, and that corrective actions are effectively implemented.

4.2.2.4. Assuring that annual management reviews are conducted and documented to assure the adequacy and effectiveness of the management system. Annual management reviews must include a summary and a documented plan of action for improvement. Documents to be considered during the annual management review must include, but are not limited to, customer complaints, back charges, internal audit results and corrective actions.

4.2.2.5. Developing quality plans that meet project specifications, and having knowledge of and access to the appropriate documents to meet this requirement.

4.2.3. **In-house Quality Control (QC) Inspector**: The fabricator shall designate an in-house quality control inspector(s) who, as a minimum, must meet the following requirements:

4.2.3.1. Be a Certified Welding Inspector (CWI) in accordance with the provisions of AWS QC1 or the equivalent requirements of the Canadian Standards Association (CSA) Standard W178.2 or ICC Structural Steel and Bolting Special Inspector, or Structural Welding Special Inspector.

4.2.3.2. Be familiar with and demonstrate knowledge of codes and specifications, as appropriate, for the scope of work specified in the contract documents.

4.2.3.3. Be responsible for assuring that only qualified and certified welders are used, as specified by contract documents for the welding process and procedures permitted for use.

4.2.3.4. Be responsible for assuring continuity of the welders' qualifications as required by American Welding Society (AWS) D1.1.

4.2.3.5. Be responsible for overall workmanship and for making sure that all weldments are 100% visually inspected. Although inspections may be delegated to qualified personnel during the receipt and in-process stages of assembly, it is the responsibility of the quality manager to ensure that inspections are performed and that the product meets project requirements.

4.2.3.6. Be responsible for ensuring that incoming raw materials are properly identified and inspected for compliance with quality plans and specifications.

4.2.3.7. Be responsible for ensuring and documenting that the final fabrication assembly can be traced back to the incoming materials, the quality assurance inspection records and the individual welder.

4.2.3.8. Be responsible for reviewing all Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs) and ensuring they are adequate before they are used in production welding operations.

Note: Approval of welding procedures must be obtained by the customer when specified by contract documents

4.2.4. **Welding Personnel**: The fabricator shall ensure that the following conditions are met:

4.2.4.1. All welding personnel shall be qualified by the test as described in AWS D1.1 or D1.3, or other accepted country-specific test standard, as appropriate, by a qualified independent third-party agency. Third-party qualification shall be by certification as an AWS Certified Welding Inspector (CWI) in accordance with the provisions of AWS QC1, *Standard for AWS Certification of Welding Inspectors*, or current qualification by the appropriate Canadian Welding Bureau (CWB) to the requirements of the Canadian Standards Association Standard W178.2, *Certification of Welding Inspectors;* or current qualification by approved third-party agencies, such as those accredited by an accreditation body that is an IAS Mutual Recognition Arrangement (MRA) partner, per ISO 9606-1 or by the International Code Council as an ICC Structural Welding Special Inspector (S2). The in-house CWI, CWB, or ICC Structural Welding Special Inspector (S2) may administer the welding tests; however, the qualification coupon shall be evaluated by the third party CWI, CWB or ICC Structural Welding Special Inspector (S2). If tensile testing is required for qualification of welding personnel, the test, or test sample, must be sent to an IAS-accredited testing laboratory for examination. Such laboratories must be accredited by IAS or by an accreditation body that is a partner with IAS in an MRA.

4.2.4.2. All welding personnel shall have and use an identifying number, letter or symbol for the purpose of traceability.

4.2.5. **Bolting**: Procedures shall be developed as required in the project documents and shall address the following: Fitting, snug-tight, pre-tensioning, and faying surfaces.

Note: Fabricators that include high-strength bolting using ASTM A325 or ASTM A490 bolts as a fabrication practice will receive recognition on the accreditation certificate. As a minimum, there must be an ICC certified Structural Steel and Bolting Special Inspector (S1) on staff.

4.2.6. **Nondestructive Testing**: Procedures shall be developed as required in the project documents.

Note: Fabricators that include nondestructive testing as a fabrication practice will receive recognition on the certificate of accreditation.

4.3. **Required Data**

The following information shall be included in the management system submittal:

4.3.1. The name of the fabrication facility, the physical street address, mailing address (if different), information of the person serving as the IAS contact (including the telephone number and e-mail address), and the telephone number of the fabrication facility.

4.3.2. A floor plan of the fabrication facility. The floor plan need not be to scale.

4.3.3. A list of major production equipment, including welding, burning, lifting and inspection equipment.

4.3.4. A list of typical items fabricated (e.g., beams, trusses, towers, signs, girders, etc.).

4.3.5. A copy of all WPSs for production welding. The WPSs shall be written to include essential and nonessential variables, in accordance with AWS D1.1, AWS D1.3, AASHTO/AWS D1.5, or AWS D1.8, as appropriate for the type of fabrication performed at the facility.

4.3.6. A copy of all PQRs for WPSs qualified by testing, when required. PQRs pertaining to AASHTO/AWS D1.5 must be current within the last five years. PQRs for the welding of fracture-critical members must be current within the last three years and must include the submerged arc welding process.

4.3.7. A list of qualified welding personnel, including their approved welding process, limitations to their qualifications and their identification marks.

4.3.8. Evidence that welding personnel are qualified by the test as described in AWS D1.1 or D1.3, or other accepted country-specific test standard, as appropriate, by a qualified independent third-party agency. Third-party qualification shall be by certification as an AWS Certified Welding Inspector (CWI) in accordance with the provisions of AWS QC1, *Standard for AWS Certification of Welding Inspectors*, or current qualification by the Canadian Welding Bureau (CWB) to the requirements of the Canadian Standards Association Standard W178.2, *Certification of Welding Inspectors,* or current qualification by approved third-party agencies, such as those accredited by an accreditation body that is a partner with IAS in an MRA, per ISO 9606-1 or by the International Code Council as a Structural Welding Special Inspector. The in-house CWI, CWB, or ICC Structural Welding Special Inspector may administer the welding tests; however, the qualification coupon shall be evaluated by the third party CWI, CWB or ICC Structural Welding Special Inspector. If tensile testing is required for qualification of welding personnel, the test, or test sample, must be sent to an IAS-accredited testing laboratory for examination. Such laboratories must be accredited by IAS or by an accreditation body that is a partner with IAS in an MRA.

4.3.9. The name and identifying number, letter or symbol of the in-house quality control inspector, for the purpose of traceability.

4.3.10. The name(s) of the deputy in-house QC inspector who assumes the position in the absence of the primary in-house QC person.

4.3.11. An organizational chart of the fabricator, including the names of the responsible quality manager/Designated Accreditation Representative. This chart must show the relationships among the CEO, project manager, quality manager, in-house quality

control inspector, deputy in-house inspector, production manager and welding personnel.

4.3.12. A list of approved vendors, including any testing agencies employed to verify a WPS.

4.3.13. A list of test and measuring equipment.

Note: Test and measuring equipment must be calibrated and traceable to a national standard. The equipment list must include sufficient testing instruments to assure quality compliance as appropriate for the items being fabricated.

4.4. **Required Statements**

The following statements shall be provided in the management system submittal:

4.4.1. A quality policy statement that includes the following elements:

4.4.1.1. All activities of the organization shall be directed in such a manner as to ensure that the quality requirements of AC172 will be met.

4.4.1.2. The elements of the quality assurance program will be disseminated to all personnel assigned activities that affect the quality of the product.

4.4.2. The manual shall, at a minimum, be reviewed annually.

4.4.3. IAS will be notified, in writing, prior to any cancellation of the inspection agreement with the accredited inspection agency.

4.4.4. Copies of reports of inspections conducted by the inspection agency, if they note major quality control variations, will be forwarded by the fabricator to IAS within 10 days of the major deficiency being reported.

4.4.5. The fabricator will notify the inspection agency when the fabrication facility is to be closed for extended time periods other than for normally scheduled periods for maintenance or vacations or two or more weeks regardless of the circumstances of the closure. IAS and the inspection agency will be notified 10 days prior to resumption of operations.

4.4.6. IAS will be notified in writing by the fabricator and the inspection agency if unannounced, follow-up inspections have not been conducted by the inspection agency.

4.4.7. The fabricator will promptly investigate and respond to IAS or a building official when informed of complaints regarding the noncompliance of finished product with stated specifications.

4.4.8. IAS and the accredited inspection agency must be notified within 30 days of any changes in management personnel. As a minimum, this would include the president, general manager, project manager, purchasing manager, production manager, Designated Accreditation Representative, quality manager or principal engineer.

4.5. **Required Written Procedures**

The fabricator shall submit written procedures for the following:

4.5.1. **Contract Review**: Review of contract documents to ensure that the needed resources exist to fulfill the contract requirements. The contract review procedure must include provisions that assure the review is appropriate, that the product and service will meet the specifications and must include a provision for the approval of exceptions or change requests. Reviews shall be performed by personnel who have access to the appropriate information and have adequate knowledge of the requirements and must be approved by the quality manager/Designated Accreditation Representative.

Reference Appendix A of AC172 for the requirements of the Designated Accreditation Representative.

4.5.2. **Document Control**: Control of documents and data relating to the quality functions of the fabricator. This control must include the following:

4.5.2.1. A document approval procedure.

4.5.2.2. A procedure to ensure that only current, approved documents are used.

4.5.2.3. A procedure to ensure that documents are available at all locations where necessary for the proper functioning of the management system.

4.5.2.4. Information on how detail drawings are prepared and how revisions to contract documents and change orders are approved.

4.5.3. **Purchasing**

4.5.3.1. Determining that purchased products will conform to specified requirements. The procedure must include a requirement that the type and grade of material be documented on the purchase order agreement.

4.5.3.2. Evaluation of subcontractors for their ability to meet subcontract requirements. Evaluations may contain summaries or logs, but must include a means of quantifying and measuring the ability of the subcontractor or supplier to provide quality products or services consistent with the required contract documents. For projects requiring IAS accreditation, subcontract fabrication may be subcontracted only to fabrication facilities that are currently IAS-accredited.

Note: While IAS understands some organizations use the term “subcontractor” synonymously with “supplier,” there is a difference, and both suppliers and subcontractors are required to be evaluated on an annual basis.

4.5.4. **Product Traceability**: The traceability procedure must describe the method used to ensure items are traceable as specified in the contract documents. Items that typically require traceability are materials and consumables that are incorporated into the final product. The project documents will determine if full materials traceability is required,

however, the fabricator must have a procedure to meet the project needs for the type of fabrication performed. In addition to project requirement needs, the fabricator, as a minimum, must have in their control traceability of the finished product to incoming materials, certified welders, inspector, plans and specifications. The procedure must make provision for documentation of this traceability on inspection forms or on a controlled copy of the detail drawing.

Note: Material traceability to heat number, unless otherwise required by contract documents, is limited to main members and does not include items such as stiffeners.

4.5.5. **Process Control**: There must be a procedure that identifies how process control is communicated to appropriate personnel. Process control includes procedures such as cutting or saw operations, fitting and welding of the material, cambering and coating. Examples of forms used in the process control procedure are cut lists, standard drawings or detail drawings. The procedure must describe the fabricator's method of communicating and establishing priorities of such operations.

4.5.6. **Inspection and Testing**: The inspection procedure shall include provisions for receipt, in-process and final inspections as appropriate to provide a level of assurance that products are manufactured in accordance with contract documents by qualified personnel. Final inspections shall include a record of the results and resolution of nonconformances identified by subsequent inspections. As a minimum, inspection procedures include the following:

4.5.6.1. Receiving inspection of incoming materials to the required specification, including review of mill test reports and certificates of conformance to ensure compliance with contract documents.

4.5.6.2. In-process inspection for workmanship that can affect subsequent operations. (Examples of in-process inspections are nondestructive testing of welds that will be hidden or out of reach during the final inspection, visual examination of fit-up tolerances that will not be visible after welding, areas requiring coatings that will not be accessible during final inspection, monitoring of welding and bolting operations, as appropriate.) Welding process inspections on multiple pass welds must ensure that proper preheat and interpass temperatures are maintained, and that the finished welds are of the proper size, without flaws, undercuts, inclusions or porosity.

4.5.6.3. Final inspection includes documented acceptance of all workmanship performed, including materials, welding, bolting, fitting operations, and coatings.

All final welds are to be accepted under the direction of the in-house CWI, CWB or ICC Structural Welding Special Inspector.

4.5.7. **Control of Inspection, Measuring and Test Equipment**: There must be a maintenance schedule, including calibration procedures for testing equipment. Wherever possible, calibration services shall be provided by a calibration laboratory accredited by IAS or by an accreditation body that is a partner with IAS in an MRA. **Note**: It is recognized there may not be nationally recognized standards available for unique testing equipment. When such instances exist, calibration procedures must be in compliance with manufacturer's recommendations to the extent that such testing equipment is calibrated to ensure consistency with the required measuring capabilities. It is the fabricator's responsibility to ensure that such testing equipment is approved prior to use.

4.5.8. **Control of Nonconforming Workmanship**: Procedures shall be established for identifying, documenting and assigning the disposition of nonconforming items.

4.5.9. **Corrective Action**: Procedure for corrective action shall include investigating, documenting and correcting nonconformances. The procedure must include a provision to preclude repetition.

4.5.10. **Handling, Storage and Delivery Procedure**: Procedure shall include identifying and storing of incoming materials and finished products as appropriate to minimize damage and deterioration.

4.5.11. **Internal Audits**: The fabricator shall identify the frequency, method of documentation and the content of internal audits to determine the effectiveness of the management system. Audits shall include a summary that compares the most recent audit to the previous audit and include the elements of AC172.

4.5.12. **Control of Quality Records**: The fabricator must determine methods for storing, maintaining and accessing quality records for a minimum of two years. Quality records must include the following:

4.5.12.1. Contract review documents.

4.5.12.2. Completed in-house quality inspection reports, forms, and checklists.

4.5.12.3. Manufacturer test reports and certificates of compliance from vendors, for incoming materials and consumables.

4.5.12.4. Copies of inspection reports by the inspection agency.

4.5.12.5. Records of internal audits.

4.5.12.6. Training records.

4.5.12.7. Evaluations of vendors and subcontractors.

4.5.13. **Training**: There must be a procedure for the training of personnel who have an effect on the quality of the finished product. The procedure must include provision for maintaining current personnel qualifications. As a minimum, there must be training

requirements established for project managers, detailers, inspectors, welders, fitters and painters.

Appendix A — Qualifications for Designated Accreditation Representative

4.6. **Scope**

International Accreditation Service, Inc. (IAS), has established a Designated Accreditation Representative (DAR) and a Designated Accreditation Representative Deputy (DARD) requirement for quality assurance and quality control (QA/QC) personnel. It is the responsibility of the fabricator to designate a DAR and a DARD as described in Sections 2.4 and 2.5 to carry out the responsibilities under Section 4.8 below.

4.7. **Introduction**

Evaluations of DAR and DARD candidates are performed during an on-site joint review of a fabricator inspection program by IAS and the fabricator's accredited inspection agency.

4.8. **General Requirements for Designated Accreditation Representative**

4.8.1. The DAR/DARD must successfully demonstrate his/her knowledge of the management system and technical operations of the fabricator, including an assessment of his/her general, practical and specific knowledge pertinent to the fabricator's current project documents.

4.8.2. The DAR must report directly to the highest level of management within the organization and must have stop-work authority.

4.8.3. The DARD will report to the DAR. In the absence of the DAR, the DARD must report directly to the highest level of management within the organization and must have stop-work authority.

4.8.4. The DAR must be able to conduct effective internal audits, identify performance indicators and recommend corrective actions. The purpose of these activities is to evaluate the overall effectiveness of the documented management system. At a minimum, the DAR must be able to perform the duties outlined in Sections 4.8.4.1, 4.8.4.2 and 4.8.4.3.

4.8.4.1. The ability to understand trend analysis measurements. Trend analyses must clearly show the direction that an activity is taking over time, to decide if corrective action is required. For example, trend analyses may be plotted to show whether costs are increasing or decreasing, if errors are declining or increasing, or if any number of factors being measured and plotted are meeting desired quality levels.

4.8.4.2. The ability to develop, implement and document staff training.

4.8.4.3. The ability to develop and implement quality plans, including generation of appropriate documentation.

Note: Although specific assignments may be delegated to a DARD, it will be the responsibility of the DAR to determine that a fabricator's management system has been successfully executed in accordance with contract documents.

4.8.5. The DAR must demonstrate competent knowledge of structural steel fabrication and inspection practices that are pertinent to products that are manufactured by the fabricator. Mandatory knowledge may include, but is not limited to: developing and implementing procedures for detailing, procurement, bolting, welding, inspection and nondestructive testing; operational procedures that include sawing, shearing, drilling and fitting practices, coatings, packaging, handling, and shipping of structural steel and/or their components. The submitted procedures must include inspection requirements as appropriate to assure compliance and implementation.

4.8.6. Fabricators must notify IAS within 10 days of the termination of employment of the DAR. Termination of the DAR may affect the fabricator's accreditation status with IAS until IAS has evaluated and approved the company's DAR replacement.

4.8.7. DAR status is not transferable from one company to another. It may be suspended upon extended leave of absence or other circumstances that prevent the DAR from performing his/her duties.

4.9. **Specific Requirements for Designated Accreditation Representative**

The DAR must demonstrate knowledge through a combination of education, training and experience of the latest editions of established codes and standards as appropriate to the fabrication of structural steel members and their components. Applicable documents may include, but are not limited to, the following:

4.9.1. *International Building Code* Chapter 17 and Chapter 22.

4.9.2. AWS D1.1, AWS D1.3 or AWS D1.8 Standards as applicable for the type of fabrication performed at the facility.

4.9.3. AWS A2.4, Symbols.

4.9.4. AWS A3.0, Terms and Definitions.

4.9.5. AISC Code of Standard Practice.

4.9.6. SSPC Painting Manual, Volume 1, Good Painting Practice.

4.9.7. SSPC Painting Manual, Volume 2, Systems and Specifications.

4.9.8. AISC Detailing for Steel Construction.

4.9.9. American Society for Non-Destructive Testing, (ASNT) SNT-TC-1A, CP-189 and ASNT Central Certification Program (ACCP).

4.9.10. ASTM International (relevant standards).

4.9.11. Research Council on Structural Connections (RCSC) – Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts.

4.9.12. Project specifications/contract documents for the current fabrication performed at the facility.

4.9.13. AWS A5.18, Specification for Carbon Steel Electrodes and Rods for Gas Shielded Arc Welding.

4.10. **Control of Required Procedures**

4.10.1. **Contract Review**: The DAR must ensure that contract quality requirements are met. The DAR will be responsible for reviewing any instructions and/or procedures relative to activities affecting quality to determine if they are properly understood and implemented.

As a minimum, the following elements must be documented to ensure that contract reviews are managed, controlled, and successfully implemented and communicated to appropriate personnel:

4.10.1.1. Quality plans to ensure that fabrication conforms to the most recent project specifications. Quality plans shall include proprietary buy-out items and subcontract fabrication. Project specifications include design drawings, detail drawings, and other related documents.

4.10.1.2. At a minimum, quality plans shall address the following:

4.10.1.2.1. Material: ASTM grade and type, AWS filler metal classification

4.10.1.2.1.1. Origin of materials

4.10.1.2.1.2. Substitution requirements

4.10.1.2.1.3. Material test report requirements

4.10.1.2.2. Workmanship

4.10.1.2.2.1. Cutting of plates or shapes

4.10.1.2.2.2. Drilling or punching of holes:

4.10.1.2.2.2.1. Edge distance

4.10.1.2.2.2.2. Repair of mislocated holes

4.10.1.2.2.3. Welding requirements:

4.10.1.2.2.3.1. Welding procedure specifications

4.10.1.2.2.3.2. Control consumables

4.10.1.2.2.4. Cambering, bending, straightening

4.10.1.2.2.5. Dimensional tolerances

4.10.1.2.3. Coating/painting/galvanizing:

4.10.1.2.3.1. Surface preparation

4.10.1.2.3.2. Manufacture and type of coating

4.10.1.2.3.3. Application of coating

4.10.1.2.4. Required inspections and sequence of inspections to verify conformance of an item or activity to specified requirements.

4.10.1.2.4.1. Procedures:

4.10.1.2.4.1.1. Receiving inspection procedures

4.10.1.2.4.1.2. In-process inspection procedures

4.10.1.2.4.1.3. Final inspection procedures

4.10.1.2.4.1.4. Records and reports

4.10.1.2.4.2. Nondestructive testing requirements

4.10.1.2.5. Acceptance criteria for inspections required in the contract documents for the scope of the project.

4.10.1.2.6. Shipping, packaging and handling requirements.

4.10.2. **Document Control**: The Designated Accreditation Representative shall be responsible to ensure that only current, approved documents are used and to ensure that appropriate documents are available at all locations where necessary for the proper functioning of the management system. Document control must encompass the following elements:

4.10.2.1. Controlled receipt of bid documents, specifications and revisions.

4.10.2.2. Approval of working (detail) drawings prior to issuing to persons using them as work instructions.

4.10.2.3. Approval of revisions, including a method for revision control to assure the latest revision is available and used by appropriate personnel.

4.10.2.4. Approval of change orders.

4.10.2.5. Documentation of back charges, including the root cause of the problem.

4.10.2.6. Records of complaints.

4.11. **Education and Experience: Designated Accreditation Representative**

Personnel shall be qualified on the basis of appropriate education, training and experience. Education and training must be such that the DAR is competent to take full charge of his/her responsibilities under the IAS DAR program. Training requirements are based on the standards referenced in Section 4.9 and Table I.

4.12. **Education and Experience: Designated Accreditation Representative Deputy**

Personnel shall be qualified on the basis of appropriate education, training and experience. Education and training must be such that the DARD is competent to take full charge of his/her

responsibilities under this program. Training requirements are based on the standards referenced in Section 4.9 and Table I

5. ADDITIONAL INFORMATION (AS APPLICABLE)

5.1. AWS B5.1, Specification for Qualification of Welding Inspectors.

5.2. AWS B5.17, Specification for the Qualification of Welding Fabricators.

5.3. ANSI/AISC 341, Seismic Provisions for Structural Steel Buildings.

5.4. ANSI/AISC 360, Specification for Structural Steel Buildings.

5.5. CSA W47.1 Certification of companies for fusion welding of steel.

6. LINKS TO ADDITIONAL REFERENCES

6.1. IAS – www.iasonline.org

6.2. International Code Council – www.iccsafe.org

Table I

DAR	DARD	Topic of Training Required	Credits
x		1. Total Quality Concepts[1]	2
x		2. Customer Satisfaction[1,2]	2
x		3. Strategic Quality Planning[1]	2
x		4. Management and Leadership[1,3]	2
x		5. Personal Communications and Interrelationship Skills[1]	2
x		6. Quality Planning and Setting Objectives[1]	2
x		7. Total Quality Principles[1]	2
x		8. Quality Auditing[1]	2
x		9. Problem Solving Methodologies[1]	2
x		10. Statistical Thinking and Techniques[1]	2
x	x	11. ASTM Material Specifications[1,3]	2
x		12. Approval and Evaluation of Vendors[1]	2
x	x	13. Mill Test Reports[1]	1
x	x	14. Material Traceability[1]	1
x		15. Contract Review[1,3]	3
x	x	16. Detail Drawings[1]	2
x		17. Subcontracting Purchase of Goods and Services[1]	2
x		18. Contract Changes[1]	2
x	x	19. Dimensional Fitting[1,4]	1
x	x	20. Welding[1,4]	2
x	x	21. Surface Preparation and Painting[1,4]	1
x	x	22. Welding Inspections[1,5]	2
x	x	23. Nondestructive Testing[1,5]	2
x	x	24. Bolting Using ASTM A325 or A490 Bolts[1,5]	2
x	x	25. Other Topics as Appropriate[6]	2 max
x	x	26. Associate Degree[7]	1
x	x	27. Associate Degree in Engineering, Science, Mathematics or Quality Assurance[7]	2
x		28. Bachelor's Degree[7]	3
x		29. BA Degree in Engineering, Science, Mathematics or Quality Assurance[7]	3
x	x	30. Two Years Technical Experience in Quality Control	2
x	x	31. Two Years Experience in Auditing[8]	3
x	x	32. Level II in Nondestructive Testing[9]	2
x		33. Level III in Nondestructive Testing[9]	3
x	x	34. ICC Structural Welding Special Inspector	3
x	x	35. AWS Senior CWI	2
x		36. CWI	2
	x	37. CAWI	1

Note: To qualify for DAR status, an individual must accrue twenty-five (25) credits. DARD education and experience must have a minimum accumulation of fifteen (15) credits.

[1] Via seminars, videos, books, self-study correspondence courses

[2] Customer feedback/information benchmarking

[3] Via professional activities

[4] Based on shop experience

[5] Hands-on inspection experience

[6] Up to two (2) credits may be earned for other performance factors not explicitly called out in this matrix, such as proven leadership, sound judgment, analytical ability, tenacity and past performance.

[7] From an accredited institution

[8] Familiarity with AC172

[9] Based on ASNT examination

This is criteria was previously issued July 2000, June 2003, May 2004, May 2005, August 2006, April 2011, August 2012, February 2015, July 2016 and April 2017.