



May 6, 2024

TO: IAS INSPECTION PROGRAMS FOR MANUFACTURERS OF METAL BUILDING SYSTEMS AND OTHER INTERESTED PARTIES.

SUBJECT: Proposed Revisions to the Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems AC472-202406-R0 (KE/DM)

Hearing Information:

IAS Accreditation Committee

Wednesday, June 26, 2024

8:30 am (Pacific Time Zone)

WebEx Meeting – Refer to IAS website for details.

Dear Madam or Sir:

The Proposed revision is due to comments received during the assessment process of several manufacturers concerning the number of hours required to certify Level I and Level II UT (Ultrasonic Testing) technicians. It has been brought to our attention that Metal Building Manufacturers Association (MBMA) has researched the use of UT in the metal building industry with experts in the field of UT and developed the “MBMA Model Written Practice – UT Certification.” This written practice outlines a different lower number of hours required to be certified as a Level I and Level II UT Technician than does the SNT-TC-1A. It is to be noted that the SNT-TC-1A is a “Recommended Practice” and not a required practice. AC472 references both documents in Section 1.3, however, SNT-TC-1A is the only document referenced in Section 4.3.1.4 of AC472. This revision will reference both documents in the section for UT and will allow the manufacturer options in how they certify their UT technicians.

You are cordially invited to submit written comments, or to attend the WebEx committee hearing and present verbal comments. Written comments will be forwarded to the committee, **prior to the hearing**, if received by June 3, 2024. For your convenience, a comment form is provided. The link can be found on the Accreditation Committee meeting page on the IAS website, www.iasonline.org. Comments must be emailed to iasinfo@iasonline.org.

Parties interested in proposed revised criteria may deliver written communications and submissions regarding such proposed criteria to IAS within approximately 30 days of posting of the public notice on the IAS website. The committee shall be informed of all pertinent written communications received by IAS. Any relevant communication and

changes to a criteria arising from the written communication/submission shall be posted to the IAS website prior to the meeting.

Participants at the accreditation committee meetings shall have the opportunity to speak on the proposed criteria to provide information to the committee. Committee meetings are generally held by electronic means. Participants are responsible to ensure access to appropriate computer equipment, software, and internet connectivity to ensure effective participation during the meeting.

Your cooperation is requested in forwarding to IAS, as noted above, all material directed to the committee. Prior to the hearing, parties interested in the deliberations of the committee should refrain from communicating, whether in writing or verbally, with committee members regarding agenda items. The committee reserves the right to refuse communications that do not comply with this request.

If you have any questions, please contact IAS at 562-364-8201. You may also reach us by e-mail at iasinfo@iasonline.org.

Yours very truly,

International Accreditation Service

IAS Management

Enclosures: Current AC472

cc: Accreditation Committee



1 **PROPOSED REVISIONS TO THE ACCREDITATION CRITERIA FOR INSPECTION**
2 **PROGRAMS FOR MANUFACTURERS OF METAL BUILDING SYSTEMS**

3
4 **AC472**

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7 **Proposed June 26, 2024**
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11 **PREFACE**
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13 The attached accreditation criteria have been proposed to provide all interested parties with an
14 opportunity to comment. These criteria may be further revised as needed. The criteria are
15 developed and adopted following public hearings conducted by the International Accreditation
16 Service, Inc. (IAS), Accreditation Committee and are effective on the first of the month following
17 approval by the Accreditation Committee, but no earlier than 30 days following the approval.
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20 **PROPOSED REVISIONS TO THE ACCREDITATION CRITERIA FOR INSPECTION PROGRAMS FOR**
21 **MANUFACTURERS OF METAL BUILDING SYSTEMS**

22
23 **1 INTRODUCTION**

24 1.1 **Scope:** These criteria set forth the requirements for obtaining and maintaining International
25 Accreditation Service, Inc. (IAS), Inspection Programs for Manufacturers of Metal Building
26 Systems accreditation. The criteria supplement the IAS Rules of Procedure for Inspection
27 Programs for Manufacturers of Metal Building Systems.

28
29 1.2 **Overview:** Accredited entities complying with these criteria will have demonstrated that they
30 have the personnel, organization, experience, knowledge, quality procedures and commitment to
31 fabricate in accordance with specified requirements. IAS-accredited inspection programs for
32 manufacturers of metal building systems operate under a documented management system
33 developed in concert with an IAS-accredited inspection agency which conducts unannounced
34 inspections to verify continued compliance with these criteria. The management system includes
35 the manufacturer's written fabrication procedures and quality control manuals which provide a
36 basis for control of materials and workmanship, with periodic inspections of fabrication and
37 quality control practices by an IAS-accredited inspection agency. Although accredited entities
38 are evaluated on their performance measures to consistently produce products of the required
39 quality mandated by specified requirements, these criteria do not cover the products or the
40 design or performance characteristics of the products.

41
42 1.3 **Normative and Reference Documents:** Publications listed below refer to current editions
43 (unless otherwise stated).

44 1.3.1 American Welding Society: D1.1, D1.3, Structural Welding Code.

45 1.3.2 ISO 9606-1, Qualification testing of welders – Fusion welding – Part 1: Steels.

46 1.3.3 ISO/IEC 17000, Conformity assessment - Vocabulary and general principles.

47 1.3.4 International Accreditation Service, Inc. (IAS), Accreditation Criteria for Inspection
48 Programs for Manufacturers of Cold-formed Steel Structural and Nonstructural
49 Components Not Requiring Welding accreditation (AC473).

50 1.3.5 IAS Rules of Procedure for Accreditation of Inspection Programs for Manufacturers of
51 Metal Building Systems.

52 1.3.6 International Building Code®, published by the International Code Council.

- 53 1.3.7 American Welding Society: A2.4, Standard Symbols for Welding, Brazing, and
54 Nondestructive Examination.
- 55 1.3.8 American Welding Society: A3.0, Standard Welding Terms and Definitions; Including
56 Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal
57 Spraying.
- 58 1.3.9 American Welding Society: QC1, Standard for AWS Certification of Welding Inspectors.
- 59 1.3.10 Canadian Standards Association: W178.2, Certification of welding inspectors.
- 60 1.3.11 The American Society for Nondestructive Testing (ASNT): SNT-TC-1A Personnel
61 Qualification and Certification in Nondestructive Testing.
- 62 1.3.12 American Institute of Steel Construction (AISC), ANSI/AISC 360 Specification for
63 Structural Steel Buildings.
- 64 1.3.13 American Iron and Steel Institute: AISI S100: North American Specification for the
65 Design of Cold-Formed Steel Structural.
- 66 1.3.14 MBMA Manuals:
- 67 1.3.14.1 Metal Building Systems Manual
- 68 1.3.14.2 Metal Roofing Systems Design Manual
- 69 1.3.14.3 Fire Resistance Design Guide for Metal Building Systems
- 70 1.3.14.4 Guide for Inspecting Metal Building Systems
- 71 1.3.14.5 MBMA Model Written Practice-UT Certification
- 72

73 2 DEFINITIONS

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

- 76 2.1 **Approved Fabricator:** An established and qualified person, firm or corporation approved by the
77 building official pursuant to the approved fabricator designation in Section 1702 of the
78 *International Building Code*[®].
- 79 2.2 **Cold-formed Products:** Products such as cold-formed Z- or C-shaped structural members or
80 roll-formed sheeting or deck designed to resist vertical and/or lateral loads.
- 81 2.3 **Contract Documents:** Documents that describe the metal building system to be supplied in its
82 entirety for a given project. These documents include work orders, drawings, specifications, and
83 buyer sketches.
- 84 2.4 **Corrective Action:** Implemented action necessary to eliminate or reduce the root cause of an
85 identified problem.

- 86 2.5 **General Manager:** The person occupying the highest position of authority within a facility's
87 organization.
- 88 2.6 **Letter of Certification:** A project document that certifies the design of the metal building system
89 as required by AC472 Section 4.6.3.2.3.
- 90 2.7 **Management System:** A set of interrelated or interacting elements that organizations use to
91 direct, control and coordinate how policies are implemented and objectives are achieved.
92 Previously, this was referred to as Quality Management System.
- 93 2.8 **Metal Building Systems Manufacturer:** An entity that may be a company, division, subsidiary
94 or similar organization that designs and manufactures a metal building system which consists of
95 an integrated set of components and assemblies, including but not limited to frames that are
96 primary structural steel members, secondary members that are cold-formed steel and steel
97 joists, and roof and wall cladding components, specifically designed to support and transfer
98 loads and provide a complete or partial building shell.
- 99 2.9 **Nonconformance:** An action employed that renders a design, member, or component
100 unacceptable for the intended use as specified in contract documents or these criteria.
- 101 2.10 **Nondestructive Testing (NDT):** The process of inspecting, testing, or evaluating materials,
102 components or assemblies for discontinuities, or differences in characteristics without
103 destroying the serviceability of the part or system.
- 104 2.11 **PQR:** Procedure Qualification Record in accordance with AWS Standards, as applicable.
- 105 2.12 **Procedure:** An implemented and written document that describes who does what, when,
106 where, why and how.
- 107 2.13 **Product:** Result of activities or processes.
- 108 2.14 **Production Engineer:** An engineer who performs final designs on projects so that project
109 documents and shop documents can be made.
- 110 2.15 **Project:** A process consisting of a set of coordinated and controlled activities undertaken to
111 achieve customer requirements.
- 112 2.16 **Project Documents:** Documents produced for the buyer's use to support the implementation
113 of the project. These documents include permit and erection drawings, installation manuals and
114 letters of certification.
- 115 2.17 **Quality Assurance:** Measurable systematic actions to assure confidence that the
116 implementation of planned activities result in meeting objectives, goals and contract
117 documents.

- 118 2.18 **Quality Control:** The act of examination, testing or measurement that verifies processes and
119 services, or that documents conform to specified criteria.
- 120 2.19 **Quality Manager:** A quality professional, designated by management who has demonstrated
121 competence in establishing, maintaining and implementing a management system with
122 consistent results. The quality manager shall have direct access to the highest executive level
123 and shall report on the performance of the quality system to the organization's management for
124 use as a basis for improvement of the management system.
- 125 2.20 **Quality Plan:** A written document that describes the procedures and policies implemented to
126 assure product quality meets requirements of specific contract documents. As a minimum,
127 quality plans must meet the requirements of Sections 4.7.1.1 and 4.7.1.2 or 4.7.2.1 and 4.7.2.2
128 of these criteria.
- 129 2.21 **Repair:** Action taken to render a member or component acceptable for the intended use.
- 130 2.22 **Shop Documents:** Documents produced that describe the individual parts and pieces of a
131 metal building system to be fabricated in the fabrication facility. These documents include shop
132 details, bills of material, manifests, bills of lading, etc.
- 133 2.23 **Specification:** A document that states the obligatory requirements to which the product must
134 conform.
- 135 2.24 **Structural Weldments:** Structural framing involving welding, coping, cutting, and drilling of
136 built-up I-shaped sections, rolled shapes, or cold-formed sections.
- 137 2.25 **Subcontractor:** An entity that provides goods or services per stipulated project or shop
138 documents. A subcontractor is hired to perform specific tasks. An example of a subcontractor is
139 a structural steel fabricator.
- 140 2.26 **Vendor:** An entity that provides inventoriable, proprietary buy-out items that are available for
141 sale. These items are typically chosen from a catalogue or list and are finite in terms of
142 available options and quantity. Examples of vendors are bolt manufacturers and steel mills.
- 143 2.27 **WPS:** Welding Procedure Specification in accordance with ANSI/AWS D1.1 or AWS D1.3, as
144 applicable.

145

146 **3 ELIGIBILITY**

147 The metal building systems manufacturer must have, at a minimum, in-house capabilities for Parts A
148 and C. Part B components can be manufactured in-house or outsourced under the quality assurance
149 requirements under Part B. Entities that outsource any cold-form secondary and sheeting products to

150 facilities that are not IAS-accredited facilities must ensure annually that the manufacturer effectively
151 implements a quality management system that is compliant with Part B of these criteria.
152

153 **4 REQUIRED BASIC INFORMATION**

154 4.1 Fabricator inspection programs for manufacturers of metal building systems must demonstrate
155 compliance with the following requirements:

156 4.1.1 The requirements of these accreditation criteria;

157 4.1.2 IAS Rules of Procedure for Accreditation of Inspection Programs for Manufacturers of
158 Metal Building Systems.

159 4.2 **General Requirements**

160 4.2.1 **Quality System**

161 4.2.1.1 Entities accredited under these criteria shall establish and implement a quality
162 system that is fully documented. This documented management system must
163 describe the procedures and quality activities for ensuring that fabricated products
164 meet the specified requirements.
165

166 4.2.1.2 A documented management system shall be prepared and submitted to IAS. The
167 documentation shall include a cross-reference matrix prepared in concert with an
168 IAS-accredited inspection agency ensuring that the general requirements in Section
169 4.2, personnel requirements in Section 4.3, data in Section 4.4, the statements in
170 Section 4.5, and the written procedures noted in Section 4.6 of these accreditation
171 criteria have been included.

172 4.2.1.3 The submitted management system must be signed and dated by the highest level of
173 authority within the organization.

174 4.2.1.4 The submitted quality assurance document must be signed and dated by an
175 authorized representative of an IAS-accredited inspection agency, attesting that the
176 inspection agency has reviewed the documented quality system and that it is
177 sufficient to allow scheduling of an onsite joint assessment with IAS.

178 4.2.2 The submitted documentation must be reviewed at least annually.

179 4.2.3 The program consists of three parts:

180 4.2.3.1 **Part A:** Fabrication of structural weldments and cold-formed products requiring
181 welding.

182 4.2.3.2 **Part B:** Fabrication of cold-formed products not requiring welding.

183 4.2.3.3 **Part C:** Design of metal building systems.

184

185 **4.3 Personnel**

186 **4.3.1 Part A**

187 4.3.1.1 **Quality Manager:** Entities accredited under these criteria shall designate a quality
188 manager who has the necessary training and experience to complete the tasks listed
189 in Sections 4.3.1.1.1 through 4.3.1.1.5. The quality manager shall report directly to
190 the highest level of authority within the organization. The quality manager shall have
191 the following responsibilities:

192 4.3.1.1.1 Maintaining the documented management system in accordance with these
193 criteria.

194 4.3.1.1.2 Monitoring the effective implementation of the documented quality system.

195 4.3.1.1.3 Assuring that periodic internal audits are conducted and documented, and
196 that corrective actions are implemented.

197 4.3.1.1.4 Assuring that annual management reviews are conducted and documented
198 to assure the adequacy and effectiveness of the management system.

199 Annual management reviews must produce a summary and a documented
200 plan of action for improvement. Documents to be considered during the
201 annual management review must include, but are not limited to, customer
202 complaints, back charges, internal audit results and corrective actions.

203 4.3.1.1.5 Developing quality plans that meet contract documents, and having
204 knowledge of and access to the appropriate documents to meet this
205 requirement.

206 4.3.1.2 **In-house Quality Control (QC) Inspector:** Entities accredited under these criteria
207 shall designate an in-house quality control inspector who, as a minimum, must meet
208 the following requirements:

209 4.3.1.2.1 Be a Certified Welding Inspector (CWI) in accordance with the provisions of
210 AWS QC1 or the equivalent requirements of the Canadian Standards
211 Association (CSA) Standard W178.2 or for an ICC Structural Welding Special
212 Inspector (S2).

213 4.3.1.2.2 Be familiar with and demonstrate knowledge of codes and specifications, as
214 appropriate, for the scope of work specified in the contract documents.

- 215 4.3.1.2.3 Be responsible for assuring that only qualified and certified welders are used,
216 as specified by contract documents for the welding process and procedures
217 permitted for use.
- 218 4.3.1.2.4 Be responsible for assuring continuity of the welders' qualifications as
219 required by American Welding Society AWS D1.1 or D1.3, as appropriate.
- 220 4.3.1.2.5 Qualified personnel must be responsible for overall workmanship and for
221 ensuring all structural members and weldments are 100 percent visually
222 inspected. Although inspections may be delegated to qualified personnel
223 during the receipt and in-process stages of assembly, it is the responsibility
224 of the in-house quality control inspector to ensure that inspections are
225 performed and documented and that the product meets project requirements.
226 Qualified personnel must meet the requirements of Section 4.3.1.2.1 of these
227 criteria or demonstrate competence to perform inspections by appropriate
228 training and/or experience in metals fabrication, inspection and testing. The
229 basis for designating qualified personnel shall be documented by the in-
230 house quality control inspector as noted in AC472 Section 4.6.1.5.3.
- 231 4.3.1.2.6 Be responsible for ensuring that incoming raw materials are properly
232 identified and inspected for compliance with quality plans and specifications.
- 233 4.3.1.2.7 Be responsible for ensuring and documenting that the final assembly can be
234 traced back to the incoming materials, the quality assurance records and the
235 individual welder.
- 236 4.3.1.2.8 Be responsible for reviewing all Welding Procedure Specifications (WPSs)
237 and Procedure Qualification Records (PQRs) before these are used in
238 production welding operations.
- 239 4.3.1.2.9 Be responsible for ensuring that fabrication of weldments and cold-formed
240 products meet the fabrication tolerances outlined in Table 4.1 or Table 4.2.
- 241 4.3.1.3 **Welding Personnel:** Entities accredited under this criteria shall ensure that the
242 following conditions are met:
- 243 4.3.1.3.1 All welding personnel shall be qualified by the test as described in
244 ANSI/AWS D1.1 or D1.3, or other accepted country-specific test standard, as
245 appropriate, by a qualified independent third-party agency. Third-party
246 qualification shall be by certification as an AWS Certified Welding Inspector
247 (CWI) in accordance with the provisions of AWS QC1, *Standard Guide for*

248 *Qualification and Certification of Welding Inspectors*; or current qualification
249 by the Canadian Welding Bureau (CWB) to the requirements of the Canadian
250 Standards Association Standard W178.2, *Certification of Welding Inspectors*;
251 or current qualification by approved third-party agencies, such as those
252 accredited by an accreditation body that is an IAS Mutual Recognition
253 Arrangement (MRA) partner, per ISO 9606-1; or by the International Code
254 Council as an ICC Structural Welding Special Inspector (S2). The in-house
255 CWI, CWB, or ICC structural welding special inspector (S2) may administer
256 the welding tests; however, the qualification coupon shall be evaluated by the
257 third party CWI, CWB or ICC Structural Welding Special Inspector. If tensile
258 testing is required for qualification of welding personnel, the test, or test
259 sample, must be sent to an IAS-accredited testing laboratory for examination.
260 Such laboratories must be accredited by IAS or by an accreditation body that
261 is a partner with IAS in an MRA.

262 4.3.1.3.2 All welding personnel shall have and use an identifying number, letter or
263 symbol for the purpose of traceability.

264 4.3.1.4 **Nondestructive Testing:** Procedures shall be developed as required by the
265 applicable building code and in the project documents.

266
267 4.3.1.5 If metal building manufacturers include nondestructive testing as an in-house
268 practice, they will receive recognition on the certificate of accreditation. As a
269 minimum, there must be in-house staff certified in accordance with SNT-TC-1A.
270 The hours required for certification as Level I and Level II UT technician shall not
271 be less than the hours stated in “MBMA Model Written Practice-UT Certification” as
272 referenced in Section 1.3.14.5.

273 274 4.3.2 **Part B**

275 4.3.2.1 **Quality Manager:** Entities accredited under these criteria shall designate a quality
276 manager who has the necessary training and experience to complete the tasks listed
277 in Sections 4.3.2.1.1 through 4.3.2.1.5. The quality manager shall report directly to
278 the highest level of authority within the organization. The quality manager shall have
279 the following responsibilities:

- 280 4.3.2.1.1 Maintaining the documented management system in accordance with these
281 criteria.
- 282 4.3.2.1.2 Monitoring the effective implementation of the documented management
283 system.
- 284 4.3.2.1.3 Assuring that periodic internal audits are conducted and documented, and
285 that corrective actions are implemented.
- 286 4.3.2.1.4 Assuring that annual management reviews are conducted and documented
287 to assure the adequacy and effectiveness of the management system.
288 Annual management reviews must produce a summary and a documented
289 plan of action for improvement. Documents to be considered during the
290 annual management review must include, but are not limited to, customer
291 complaints, back charges, internal audit results and corrective actions.
- 292 4.3.2.1.5 Developing quality plans that meet contract documents, and having
293 knowledge of and access to the appropriate documents to meet this
294 requirement.
- 295 4.3.2.2 **In-house Quality Control (QC) Inspector:** Entities accredited under this criteria
296 shall designate an in-house quality control inspector who, as a minimum, must meet
297 the following requirements:
- 298 4.3.2.2.1 Be familiar with and demonstrate knowledge of codes and specifications, as
299 appropriate, for the scope of work specified in the contract documents.
- 300 4.3.2.2.2 Be responsible for ensuring that incoming raw materials are properly
301 identified and inspected for compliance with quality plans and specifications.
- 302 4.3.2.2.3 Be responsible for ensuring and documenting that the final fabrication
303 assembly can be traced back to the incoming materials and the quality
304 assurance records.
- 305 4.3.2.2.4 Be responsible for ensuring that fabrication of cold-formed products meets
306 the fabrication tolerances outlined in Table 4.1.
- 307 4.3.3 **Part C**
- 308 **Engineer in Responsible Charge:** Entities accredited under these criteria shall
309 designate an Engineer in Responsible Charge who, as a minimum, must meet the
310 following requirements:
- 311 4.3.3.1 Be a professional engineer registered or licensed in the United States to practice
312 engineering or an engineer duly registered or licensed in the country in which the

313 facility is located, who has experience with the building code and the design of metal
314 building systems.

315 4.3.3.2 Have full authority for the control of engineering performed at the facility as related to
316 technical decision making. This person need not be the highest level of authority
317 within the organization of the facility as long as appropriate technical authority has
318 been granted to him/her.

319 4.3.3.3 Assuring that annual management reviews are conducted to assure the adequacy
320 and effectiveness of the quality system. Annual management reviews must produce a
321 documented summary and a documented plan of action for improvement. Documents
322 to be considered during the annual management review must include, but are not
323 limited to, customer complaints, back charges, internal audit results and corrective
324 actions.

326 4.4 Required Data

327 4.4.1 Part A

328 4.4.1.1 The name of the facility, the physical street address, mailing address (if different),
329 information on the person serving as the IAS contact (including the telephone
330 number and e-mail address), and the telephone number of the facility.

331 4.4.1.2 A floor plan of the fabrication facility. The floor plan need not be to scale.

332 4.4.1.3 A list of major production equipment, including welding, burning, lifting and inspection
333 equipment.

334 4.4.1.4 A list of typical items fabricated (e.g., beams, trusses, girders, bracing members,
335 etc.).

336 4.4.1.5 A copy of all WPSs for production welding. The WPSs shall be written to include
337 essential and nonessential variables, in accordance with AWS D1.1 or D1.3, as
338 appropriate for the type of fabrication performed at the facility.

339 4.4.1.6 A copy of all PQRs for WPSs qualified by testing, when required.

340 4.4.1.7 A list of qualified welding personnel, including their approved welding process,
341 limitations on their qualifications and their identification marks.

342 4.4.1.8 Evidence that welding personnel are qualified by an independent, third-party CWI,
343 CWB, or ICC Structural Welding Special Inspector in accordance with Section
344 4.3.1.3.1 of these criteria.

- 345 4.4.1.9 The name and certification number of the CWI, CWB, or ICC Structural Welding
346 Special Inspector acting as the in-house quality control inspector.
- 347 4.4.1.10 The name of the deputy in-house QC inspector who assumes the position in the
348 absence of the primary in-house QC person.
- 349 4.4.1.11 An organizational chart including the names of the responsible quality managers.
350 This chart must show the relationships among the CEO, the Engineer In
351 Responsible Charge, general manager, quality manager, in-house quality control
352 inspector, deputy in-house inspector, production manager and welding personnel.
- 353 4.4.1.12 A list of approved vendors, including any testing agencies employed to verify a
354 WPS.
- 355 4.4.1.13 A list of test and measuring equipment.
356 Test and measuring equipment must be calibrated and traceable to a national
357 standard. The equipment list must include sufficient testing instruments to assure
358 quality compliance as appropriate for the items being fabricated.
- 359 **4.4.2 Part B**
- 360 4.4.2.1 The name of the facility, the physical street address, mailing address (if different),
361 information on the person serving as the IAS contact (including the telephone
362 number and e-mail address), and the telephone number of the facility.
- 363 4.4.2.2 A floor plan of the fabrication facility. The floor plan need not be to scale.
- 364 4.4.2.3 A list of major production equipment, including burning, lifting and inspection
365 equipment.
- 366 4.4.2.4 A list of typical items fabricated (e.g., cold formed sections, roof and wall panels,
367 etc.).
- 368 4.4.2.5 The name of the deputy in-house QC inspector who assumes the position in the
369 absence of the primary in-house QC person.
- 370 4.4.2.6 An organizational chart including the names of the responsible quality managers.
371 This chart must show the relationships among the CEO, general manager, quality
372 manager, in-house quality control inspector, deputy in-house inspector and
373 production manager.
- 374 4.4.2.7 A list of approved vendors.
- 375 4.4.2.8 A list of test and measuring equipment.

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

379 **4.4.3 Part C**

380 4.4.3.1 The name of the facility, the physical street address, mailing address (if different),
381 information on the person serving as the IAS contact (including the telephone
382 number and e-mail address), and the telephone number of the facility.

383 4.4.3.2 An organizational chart showing the relationships among the CEO, general manager,
384 Engineer in Responsible Charge, and production engineers.

385 4.4.3.3 A listing of all engineers performing production engineering, along with their years of
386 experience in designing metal building systems.

387
388 **4.5 Required Statements**

389 **4.5.1 Part A**

390 The following statements shall be provided in the quality system submittal:

391 4.5.1.1 A quality policy statement that includes the following elements:

392 4.5.1.1.1 All activities of the organization shall be directed in such a manner as to
393 ensure that the quality requirements of AC472 will be met.

394 4.5.1.1.2 The elements of the quality assurance program will be disseminated to all
395 personnel assigned activities that affect the quality of the product.

396 4.5.1.2 IAS will be notified, in writing prior to any cancellation of the inspection agreement
397 with the accredited inspection agency.

398 4.5.1.3 Copies of reports of inspections conducted by the inspection agency, if they note
399 major quality control variations, will be forwarded to IAS within 10 days of the major
400 deficiency having been reported.

401 4.5.1.4 Entities accredited under these criteria will notify the inspection agency when the
402 facility is to be closed for extended time periods other than for normally scheduled
403 periods for maintenance or vacations, or for two or more weeks regardless of the
404 circumstances of the closure. IAS and the inspection agency will be notified 10 days
405 prior to resumption of operations.

406 4.5.1.5 IAS will be notified in writing by the accredited entity and the inspection agency if
407 unannounced, follow-up inspections have not been conducted by the inspection
408 agency.

409 4.5.1.6 IAS and the accredited inspection agency must be notified within 30 days of any
410 changes in management personnel. As a minimum, this would include the president,
411 general manager, purchasing manager, production manager or quality manager.

412 **4.5.2 Part B**

413 The following statements shall be provided in the quality system submittal:

414 4.5.2.1 A quality policy statement that includes the following elements:

415 4.5.2.1.1 All activities of the organization shall be directed in such a manner as to
416 ensure that the quality requirements of AC472 will be met.

417 4.5.2.1.2 The elements of the quality assurance program will be disseminated to all
418 personnel assigned activities that affect the quality of the product.

419 4.5.2.2 IAS will be notified, in writing, prior to any cancellation of the inspection agreement
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421 4.5.2.3 Copies of reports of inspections conducted by the inspection agency, if they note
422 major quality control variations, will be forwarded to IAS within 10 days of the major
423 deficiency being reported.

424 4.5.2.4 Entities accredited under these criteria will notify the inspection agency when the
425 facility is to be closed for extended time periods other than for normally scheduled
426 periods for maintenance or vacations, or for two or more weeks regardless of the
427 circumstances of the closure. IAS and the inspection agency will be notified 10 days
428 prior to resumption of operations.

429 4.5.2.5 IAS will be notified in writing by the accredited entity and the inspection agency if
430 unannounced, follow-up inspections have not been conducted by the inspection
431 agency.

432 4.5.2.6 IAS and the accredited inspection agency must be notified within 30 days of any
433 changes in management personnel. As a minimum, this would include the president,
434 general manager, purchasing manager, production manager, or quality manager.

435 **4.5.3 Part C**

436 4.5.3.1 A quality policy statement that includes the following elements:

437 4.5.3.1.1 All activities of the organization shall be directed in such a manner as to
438 ensure that the quality requirements of AC472 will be met.

439 4.5.3.1.2 The elements of the quality assurance program will be disseminated to all
440 engineering personnel performing production engineering.

- 441 4.5.3.2 IAS will be notified, in writing, prior to any cancellation of the inspection agreement
442 with the accredited inspection agency.
- 443 4.5.3.3 Copies of reports of inspections conducted by the inspection agency, if they note
444 major quality control variations, will be forwarded by the accredited entity to IAS
445 within 10 days of the major deficiency being reported.
- 446 4.5.3.4 Entities accredited under these criteria will notify the inspection agency when the
447 facility is to be closed for extended time periods other than for normally scheduled
448 periods for maintenance or vacations, or for two or more weeks regardless of the
449 circumstances of the closure. IAS and the inspection agency will be notified 10 days
450 prior to resumption of operations.
- 451 4.5.3.5 IAS will be notified in writing by the accredited entity and the inspection agency if
452 unannounced, follow-up inspections have not been conducted by the inspection
453 agency.
- 454 4.5.3.6 IAS and the accredited inspection agency must be notified within 30 days of any
455 changes in management personnel. As a minimum, this would include the president,
456 general manager, or Engineer in Responsible Charge.
- 457 4.5.3.7 A Letter of Certification will be issued for all projects per the procedure required in
458 Section 4.6.3.2.3.

460 4.6 Required Written Procedures

461 Entities accredited under these criteria shall submit written procedures for the following:

462 4.6.1 Part A

463 4.6.1.1 **Document Control:** Control of documents and data relating to the quality functions
464 must be provided. This control shall include the following:

465 4.6.1.1.1 A document approval procedure.

466 4.6.1.1.2 A procedure to ensure that only current, approved documents are used.

467 4.6.1.1.3 A procedure to ensure that documents are available at all locations where
468 necessary for the proper functioning of the management system.

469 4.6.1.2 Purchasing

470 4.6.1.2.1 Determining that purchased products will conform to specified requirements.
471 The procedure must include a requirement that the type and grade of
472 material be documented on the purchase order agreement.

473 4.6.1.2.2 Evaluation of subcontractors for their ability to meet subcontract
474 requirements. Evaluations may contain summaries or logs, but must include
475 a means of quantifying and measuring the ability of the subcontractor or
476 supplier to provide quality products or services consistent with the required
477 shop documents. For projects requiring IAS accreditation, fabrication may be
478 subcontracted only to fabrication facilities that are currently IAS-accredited to
479 AC472 or AC172 for primary frames or a fabrication facility that is AISC
480 Certified. The organization that elects to subcontract work must ensure their
481 in-house CWI is responsible for 100% of all welding regardless if the welding
482 was performed in-house or subcontracted.

483 4.6.1.3 **Product Traceability:** The traceability procedure must describe the method used to
484 ensure items are traceable as specified in the contract documents. Items that
485 typically require traceability are materials and consumables that are incorporated into
486 the final product. The project documents will determine if full materials traceability is
487 required; however, the accredited entity must have a procedure to meet the project
488 needs for the type of fabrication performed. In addition to project requirement needs,
489 the accredited entity, as a minimum, must have in their control traceability of the
490 finished product to incoming materials, certified welders, inspectors, plans and
491 specifications. The procedure must make provision for documentation of this
492 traceability on inspection forms or on a controlled copy of the detail drawing.

493
494 Material traceability to heat number, unless otherwise required by contract
495 documents, is limited to main members and does not include items such as
496 stiffeners, clips, and bolted end plates. As a minimum, all steel used and incorporated
497 into the final product must be traceable to the type and grade of material.

498 4.6.1.4 **Process Control:** There must be a procedure that identifies how process control is
499 communicated to appropriate personnel. Process control includes procedures such
500 as cutting or saw operations, fitting and welding of the material, cambering and
501 coating. Examples of forms used in the process control procedure are cut lists,
502 standard drawings or detail drawings. The procedure must describe the accredited
503 entity's method of communicating and establishing priorities of such operations.

504 4.6.1.5 **Inspection and Testing:** The inspection procedure shall include provisions for
505 receipt, in-process and final inspections as appropriate to provide a level of

506 assurance that products are fabricated in accordance with contract documents by
507 qualified personnel. Final inspections shall include a record of the results and
508 resolution of nonconformances identified by subsequent inspections. As a minimum,
509 inspection procedures shall include the following:

510 4.6.1.5.1 Receiving inspection of incoming materials to the required specification,
511 including review of mill test reports and certificates of conformance to ensure
512 compliance with contract documents.

513 4.6.1.5.2 In-process inspection for workmanship that can affect subsequent
514 operations. (Examples of in-process inspections are nondestructive testing of
515 welds that will be hidden or out of reach during the final inspection; visual
516 examination of fit-up tolerances that will not be visible after welding; areas
517 requiring coatings that will not be accessible during final inspection;
518 monitoring of welding operations as appropriate; fabrication tolerances per
519 Table 4.1; and monitoring of roll-forming operations for shape tolerances per
520 Figure 4.1.) Welding process inspections on multiple pass welds must ensure
521 that proper preheat and interpass temperatures are maintained and that the
522 finished welds meet the tolerances specified in the contract documents and
523 are of the required size, without rejectable indications such as cracks,
524 undercuts, inclusions or porosity. In the event in-process weld inspections
525 are delegated by the in-house Certified Welding Inspector (CWI), there must
526 be documentation ensuring personnel performing assigned inspections have
527 been trained on the specific tasks that are delegated.

528 4.6.1.5.3 All final welds are to be accepted under the direction of the in-house CWI,
529 CWB, or ICC Structural Welding Special Inspector. There must be a record
530 of the final inspection ensuring that receiving, in-process and final
531 inspections have been performed.

532 **Note:** All inspectors or assistant inspectors who accept or reject welds must
533 have a current eye exam in accordance with AWS D1.1.

534 4.6.1.6 **Control of Inspection, Measuring and Test Equipment:** There must be a
535 maintenance schedule, including calibration procedures for testing equipment.
536 Wherever possible, calibration services shall be provided by a calibration laboratory
537 accredited by IAS or by an accreditation body that is a partner with IAS in a mutual
538 recognition arrangement.

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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 accredited entity's responsibility to ensure that such testing equipment is approved prior to use.

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

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

4.6.1.9 Handling, storage and delivery procedures shall include identifying and storing of incoming materials and finished products as appropriate to minimize damage and deterioration.

4.6.1.10 **Internal Audits:** Entities accredited under these criteria shall identify the frequency, method of documentation and the content of internal audits to determine the effectiveness of the quality system. Audits shall include a summary that compares the most recent audit to the previous audit, and shall include the elements of AC472.

4.6.1.11 **Control of Quality Records:** Entities accredited under these criteria must determine methods for storing, maintaining and accessing quality records for a minimum of two years. Quality records must include the following:

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

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

4.6.1.11.3 Copies of inspection reports by the inspection agency.

4.6.1.11.4 Records of internal audits.

4.6.1.11.5 Training records.

4.6.1.11.6 Evaluations of vendors and subcontractors.

4.6.1.12 **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

572 training requirements established for inspectors, assistant inspectors, machine
573 operators, welders, and fitters.

574 4.6.2 **Part B**

575 4.6.2.1 **Document Control:** Control of documents and data relating to the quality functions
576 must be provided. This control shall include the following:

577 4.6.2.1.1 A document approval procedure.

578 4.6.2.1.2 A procedure to ensure that only current, approved documents are used.

579 4.6.2.1.3 A procedure to ensure that documents are available at all locations where
580 necessary for the proper functioning of the management system.

581 4.6.2.2 **Purchasing**

582 4.6.2.2.1 Determining that purchased products will conform to specified requirements.
583 The procedure must include a requirement that the type and grade of
584 material be documented on the purchase order agreement.

585 4.6.2.2.2 Evaluation of subcontractors for their ability to meet subcontract
586 requirements. Evaluations may contain summaries or logs, but must include
587 a means of quantifying and measuring the ability of the subcontractor or
588 supplier to provide quality products or services consistent with the required
589 shop documents.

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

594 4.6.2.3 **Product Traceability:** The traceability procedure must describe the method used to
595 ensure items are traceable as specified in the contract documents. Items that
596 typically require traceability are materials and consumables that are incorporated into
597 the final product. The project documents will determine if full materials traceability is
598 required; however, the accredited entity must have a procedure to meet the project
599 needs for the type of fabrication performed. In addition to project requirement needs,
600 the accredited entity, as a minimum, must have in their control traceability of the
601 finished product to incoming materials, inspectors, plans and specifications. The
602 procedure must make provision for documentation of this traceability on inspection
603 forms or on a controlled copy of the detail drawing. Material traceability to a heat
604 number, unless otherwise required by contract documents, is limited to main

605 members and does not include items such as clips. However, as a minimum, all steel
606 used and incorporated into the final product must be traceable to the type and grade
607 of material.

608 4.6.2.4 **Process Control:** There must be a procedure that identifies how process control is
609 communicated to appropriate personnel. Process control includes procedures such
610 as cutting or saw operations and coating. Examples of forms used in the process
611 control procedure are cut lists, standard drawings or detail drawings. The procedure
612 must describe the method of communicating and establishing priorities of such
613 operations.

614 **Note:** Manufacturers shall have a written procedure for implementing the Steel
615 Coalition Lubricant Task Group Final Report dated May 14, 2002, and show evidence
616 that roll formed roof panels and decking are in conformance with the manufacturer's
617 written standards with regards to lubricants and labeling.

618 4.6.2.5 **Inspection and Testing:** The inspection procedure shall include provisions for
619 receipt, in-process and final inspections as appropriate to provide a level of
620 assurance that products are fabricated in accordance with contract documents by
621 qualified personnel. Final inspections shall include a record of the results and
622 resolution of nonconformances identified by subsequent inspections. As a minimum,
623 inspection procedures include the following:

624 4.6.2.5.1 Receiving inspection of incoming materials to the required specification,
625 including review of mill test reports and certificates of conformance to ensure
626 compliance with contract documents.

627 4.6.2.5.2 In-process inspection for workmanship that can affect subsequent
628 operations. (Examples of in-process inspections are areas requiring coatings
629 that will not be accessible during final inspection, fabrication tolerances per
630 Table 4.1 or Table 4.2, and monitoring of roll-forming operations for shape
631 tolerances per Figure 4.1.)

632 4.6.2.5.3 Final inspection includes documented acceptance of all workmanship
633 performed, including materials and coatings.

634 4.6.2.6 **Control of Inspection, Measuring and Test Equipment:** There must be a
635 maintenance schedule, including calibration procedures for testing equipment.
636 Wherever possible, calibration services shall be provided by a calibration laboratory

637 accredited by IAS or by an accreditation body that is a partner with IAS in a mutual
638 recognition arrangement.

639
640 It is recognized there may not be nationally recognized standards available for
641 unique testing equipment. When such instances exist, calibration procedures must be
642 in compliance with manufacturer's recommendations to the extent that such testing
643 equipment is calibrated to ensure consistency with the required measuring
644 capabilities. It is the accredited entity's responsibility to ensure that such testing
645 equipment is approved prior to use.

646 4.6.2.7 **Control of Nonconforming Workmanship:** Procedures shall be established for
647 identifying, documenting and assigning the disposition of nonconforming items.

648 4.6.2.8 **Corrective Action:** The procedure for corrective action shall include investigating,
649 documenting and correcting nonconformances. The procedure must include a
650 provision to preclude repetition.

651 4.6.2.9 Handling, storage and delivery procedure shall include identifying and storing of
652 incoming materials and finished products as appropriate to minimize damage and
653 deterioration.

654 4.6.2.10 **Internal Audits:** Entities accredited under these criteria shall identify the
655 frequency, method of documentation and the content of internal audits to determine
656 the effectiveness of the quality system. Audits shall include a summary that
657 compares the most recent audit to the previous audit, and shall include the
658 elements of AC472.

659 4.6.2.11 **Control of Quality Records:** Entities accredited under these criteria must
660 determine methods for storing, maintaining and accessing quality records for a
661 minimum of two years. Quality records must include the following:

662 4.6.2.11.1 Completed in-house quality inspection reports, forms, and checklists.

663 4.6.2.11.2 Manufacturer test reports and certificates of compliance from vendors, for
664 incoming materials and consumables.

665 4.6.2.11.3 Copies of inspection reports by the inspection agency.

666 4.6.2.11.4 Records of internal audits.

667 4.6.2.11.5 Training records.

668 4.6.2.11.6 Evaluations of vendors and subcontractors.

669 4.6.2.12 **Training:** There must be a procedure for the training of personnel who have an
670 effect on the quality of the finished product. The procedure must include provision
671 for maintaining current personnel qualifications. As a minimum, there must be
672 training requirements established for inspectors and machine operators.

673 4.6.3 **Part C**

674 4.6.3.1 **Contract Review:** Review of contract documents to ensure that the needed
675 resources exist to fulfill the contract requirements. The contract review procedure
676 must include provisions that assure the review is appropriate, and that the product
677 and service will meet the specifications. Procedures must include a provision for the
678 approval of exceptions or change requests. Reviews shall be performed by personnel
679 who have access to the appropriate information and have adequate knowledge of the
680 contract requirements. Reviews must be approved by the Engineer in Responsible
681 Charge.

682 4.6.3.2 **Engineering:** Entities accredited under these criteria shall have written procedures
683 for production engineering that shall include, at a minimum, requirements covering
684 the information in Sections 4.6.3.2.1 through 4.6.3.2.4.

685 4.6.3.2.1 Information on how incoming contract documents are to be evaluated and
686 provided to the design engineer.

687 4.6.3.2.2 Information for the preparation and checking of design calculations and
688 erection drawings. Design calculations are to be in conformance with the
689 specified codes and standards.

690 4.6.3.2.3 A procedure for the creation of a Letter of Certification. All information
691 pertinent to the structural design that is required to be indicated on the
692 construction documents, as noted in Section 1603 of the applicable edition of
693 the *International Building Code*[®], is to be included. The Letter of Certification
694 shall be sealed in accordance with the engineering laws of the appropriate
695 jurisdiction. As a minimum, the letter of certification shall be in accordance
696 with the requirements of the appropriate jurisdiction.

697 4.6.3.2.4 Information on how detail drawings are prepared and how revisions to project
698 or shop documents and change orders are approved.

699 4.6.3.3 **Control of Quality Records:** Entities accredited under these criteria must determine
700 methods for storing, maintaining and accessing quality records for a minimum of two
701 years. Quality records must include the following:

- 702 4.6.3.3.1 Order documents
703 4.6.3.3.2 Contract review documents
704 4.6.3.3.3 Design calculations and drawings
705 4.6.3.3.4 Certificate of design conformance
706 4.6.3.3.5 Training records
707 4.6.3.3.6 Evaluations of subcontract engineers and detailers.
708 4.6.3.4 **Training:** There must be a procedure for the training of personnel who have an
709 effect on the quality of the finished product. The procedure must include provision for
710 maintaining current personnel qualifications. As a minimum, there must be training
711 requirements established for project managers, engineers and detailers.
712 4.6.3.5 **Corrective Action:** The procedure for corrective action shall include investigating,
713 documenting and correcting nonconformances. The procedure must include a
714 provision to preclude repetition.
715 4.6.3.6 **Internal Audits:** Entities accredited under these criteria shall identify the frequency,
716 method of documentation and the content of internal audits to determine the
717 effectiveness of the quality system. Audits shall include a summary that compares
718 the most recent audit to the previous audit, and shall include the elements of AC472.
719

720 4.7 Control of Required Procedures

721 4.7.1 /Part A

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

726
727 As a minimum, the following elements must be documented to ensure that contract
728 reviews are managed, controlled, and successfully implemented and communicated to
729 appropriate personnel:

- 730 4.7.1.1 Quality plans to ensure that fabrication conforms to the most recent project
731 specifications. Quality plans shall include proprietary buy-out items and subcontract
732 fabrication. Project specifications include design drawings, detail drawings, and other
733 related documents.

- 734 4.7.1.2 As a minimum, quality plans shall address the following:

- 735 4.7.1.2.1 **Material:** ASTM Grade and Type, AWS filler metal classification.
- 736 4.7.1.2.1.1 Origin of materials
- 737 4.7.1.2.1.2 Substitution requirements
- 738 4.7.1.2.1.3 Material test report requirements
- 739 4.7.1.2.2 **Workmanship**
- 740 4.7.1.2.2.1 Cutting of components
- 741 4.7.1.2.2.1.1 Drilling or punching of holes
- 742 4.7.1.2.2.1.1.1 Edge distance
- 743 4.7.1.2.2.1.1.2 Repair of miss-located holes
- 744 4.7.1.2.2.1.2 Welding requirements
- 745 4.7.1.2.2.1.2.1 Welding procedure specifications
- 746 4.7.1.2.2.1.2.2 Control consumables
- 747 4.7.1.2.2.1.2.3 Cambering, bending, straightening
- 748 4.7.1.2.2.1.2.4 Dimensional tolerances (See Table 4.2 for built-up section
- 749 tolerances)
- 750 4.7.1.2.3 **Coating/Painting/Galvanizing**
- 751 4.7.1.2.3.1 Surface preparation
- 752 4.7.1.2.3.2 Manufacture and type of coating
- 753 4.7.1.2.3.3 Application of coating
- 754 4.7.1.2.4 Required inspections and sequence of inspections to verify conformance of
- 755 an item or activity to specified requirements. Procedures needed:
- 756 4.7.1.2.4.1 Receiving
- 757 4.7.1.2.4.2 In-process
- 758 4.7.1.2.4.3 Final
- 759 4.7.1.2.4.4 Records and reports
- 760 4.7.1.2.4.5 Nondestructive testing requirements
- 761 4.7.1.2.5 Acceptance criteria for inspections required in the contract documents for the
- 762 scope of the project.
- 763 4.7.1.2.6 Shipping, packaging, and handling requirements.
- 764 4.7.2 **Part B**
- 765 **Contract Review:** The quality manager must ensure that contract quality requirements
- 766 are met. The quality manager will be responsible for reviewing any instructions and/or

767 procedures relative to activities affecting quality to determine if they are properly
768 understood and implemented.

769
770 As a minimum, the following elements must be documented to ensure that contract
771 reviews are managed, controlled, and successfully implemented and communicated to
772 appropriate personnel:

773 4.7.2.1 Quality plans to ensure that fabrication conforms to the most recent project
774 specifications. Quality plans shall include proprietary buy-out items and subcontract
775 fabrication. Project specifications include design drawings, detail drawings, and other
776 related documents.

777 4.7.2.2 As a minimum, quality plans shall address the following:

778 4.7.2.2.1 **Material:** ASTM Grade and Type:

779 4.7.2.2.1.1 Origin of materials

780 4.7.2.2.1.2 Substitution requirements

781 4.7.2.2.1.3 Material test report requirements

782 4.7.2.2.2 **Workmanship**

783 4.7.2.2.2.1 Cutting of components

784 4.7.2.2.2.2 Drilling or punching of holes

785 4.7.2.2.2.3 Edge distance

786 4.7.2.2.2.4 Cambering, bending, straightening

787 4.7.2.2.2.5 Dimensional tolerances (See Tables 4.1 and 4.2 for section tolerances)

788 4.7.2.2.3 **Coating/Painting/Galvanizing**

789 4.7.2.2.3.1 Surface preparation

790 4.7.2.2.3.2 Manufacture and type of coating

791 4.7.2.2.3.3 Application of coating

792 4.7.2.2.3.4 Protection of coating

793 4.7.2.2.4 Required inspections and sequence of inspections to verify conformance of
794 an item or activity to specified requirements. Procedures needed:

795 4.7.2.2.4.1 Receiving

796 4.7.2.2.4.2 In-process

797 4.7.2.2.4.3 Final

798 4.7.2.2.4.4 Records and reports

799 4.7.2.2.5 Acceptance criteria for inspections required in the contract documents for the
800 scope of the project.

801 4.7.2.2.6 Shipping, packaging and handling requirements.

802 4.7.3 Part C

803 4.7.3.1 **Contract Review:** The Engineer in Responsible Charge must ensure that contract
804 requirements are met. The Engineer in Responsible Charge will be responsible for
805 reviewing the contract documents relative to requirements affecting engineering to
806 determine if they are properly understood and implemented.

807 4.7.3.2 **Design Review:** The Engineer in Responsible Charge will be responsible for
808 ensuring that the production engineer reviews the design documents and the shop
809 documents to verify that the contract requirements are met.

810

811 4.8 Fabrication Tolerances

812 4.8.1 **Cold-formed Structural Members:** The fabrication tolerances indicated in Figure 4.1
813 for cold-formed structural members are defined in Table 4.1.

814 4.8.2 **Built-up Structural Members:** The fabrication tolerances indicated in Figures 4.2(a)
815 and 4.2(b) for built-up structural members are defined in Table 4.2.

816

817 5 ADDITIONAL INFORMATION (AS APPLICABLE)

818 5.1 AWS Welding Quality Assurance Guideline for Fabricators.

819 5.2 SSPC, The Society for Protective Coatings.

820 5.2.1 Steel Structures Painting Manual, Volume I, Good Painting Practice.

821 5.2.2 Steel Structures Painting Manual, Volume II, Systems and Specifications.

822 5.3 Steel Joist Institute(SJI) Specifications.

823 5.4 SJI K-I.1 Standard Specification for Open Web Steel Joists, K-Series.

824 5.5 SJI LH/DLH-I.1 Standard Specification for Longspan Steel Joists, LH Series and Deep
825 Longspan Steel Joists, DLH Series.

826 5.6 Steel Coalition Lubricant Task Group Final Report, May14, 2002.

827

828 6 LINKS TO ADDITIONAL REFERENCES

829 6.1 IAS – www.iasonline.org

830 6.2 International Code Council – www.iccsafe.org

831 6.3 MBMA – www.mbma.com

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Table 4.1
Cold-formed Structural Members

Formed Structural Members			
	Dimension	Tolerances	
		+	-
Geometry	D	3/16"	3/16"
	B	3/16"	3/16"
	d	3/8"	1/8"
	θ_1	3°	3°
	θ_2	5°	5°
Hole Location	E ₁	1/8"	1/8"
	E ₂	1/8"	1/8"
	E ₃	1/8"	1/8"
	S ₁	1/16"	1/16"
	S ₂	1/16"	1/16"
	F	1/8"	1/8"
	P	1/8"	1/8"
Length (L)		1/8"	1/8"
Camber (C)		1/4" x L (ft)/ 10	
Minimum Thickness (t)		0.95 (Design t)	

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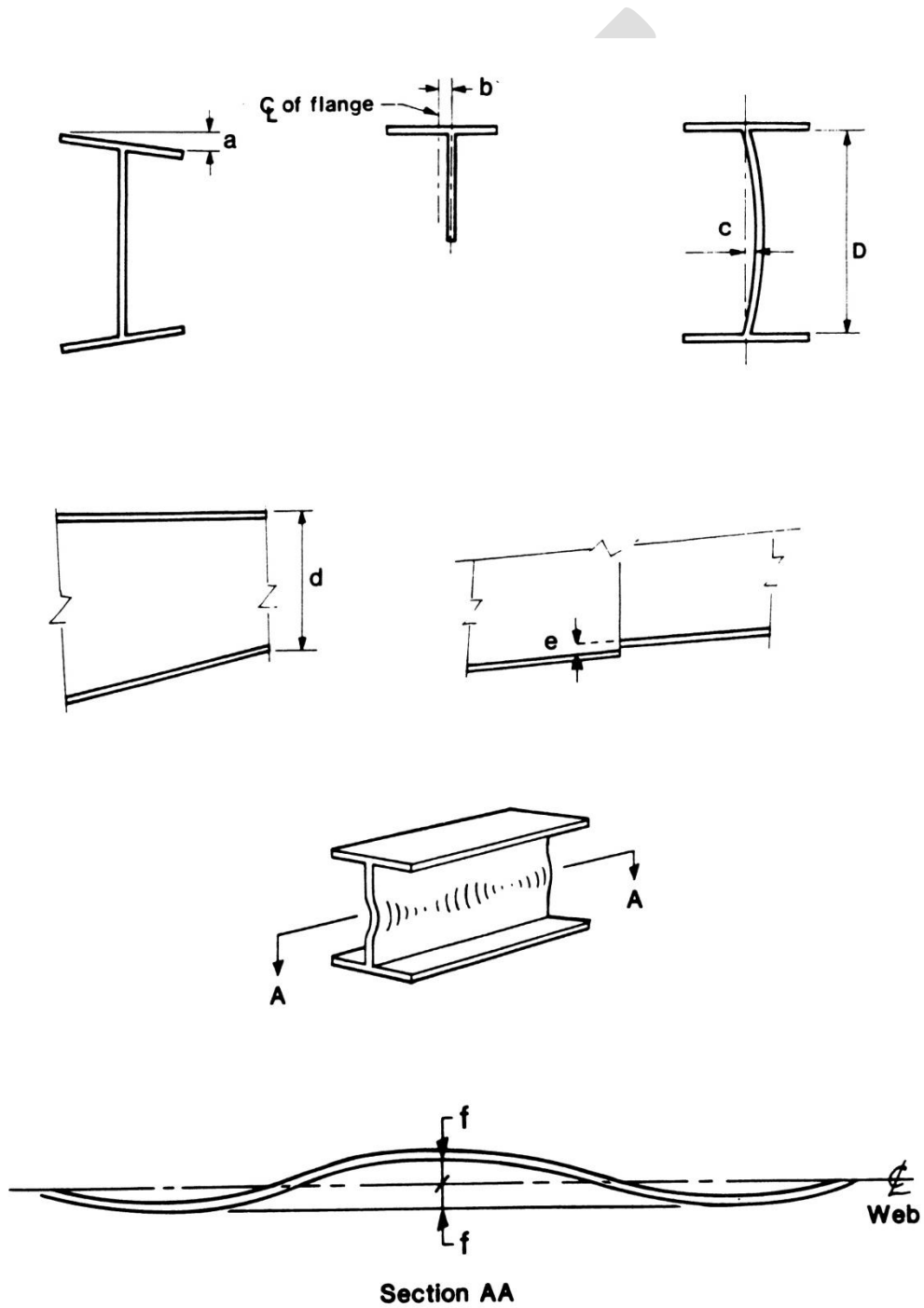
Table 4.2
Built-up Structural Members

Built-up Structural Members					
	Dimension		Tolerances		
			+	-	
	a		3°- 1/4" Max	3°- 1/4" Max	
	b		1/4"	1/4"	
	d		3/16"	3/16"	
	e		1/8"	1/8"	
	c		D/72"		
	f		D/72"		
	E1		1/8"	1/8"	
	E2		1/8"	1/8"	
	E3		1/8"	1/8"	
	S1		1/16"	1/16"	
	S2		1/16"	1/16"	
	F		1/8"	1/8"	
Length (L)			1/4"	1/4"	
Sweep (S)			Runway Beams 1/8" x L(ft)/ 10 All Other members 1/4" x L(ft)/ 10		
Camber (C)			1/4" x L(ft)/ 10		
Splice Plates	N ₁		1/8"	1/8"	
	N ₂		3/16"	3/16"	
	G ₁		1/16"	1/16"	
	G ₂		1/16"	1/16"	
	H	Up to 24"		1/8"	1/8"
		24" to 48"		3/16"	3/16"
		Over 48"		1/4"	1/4"
	J		1/4"	1/4"	

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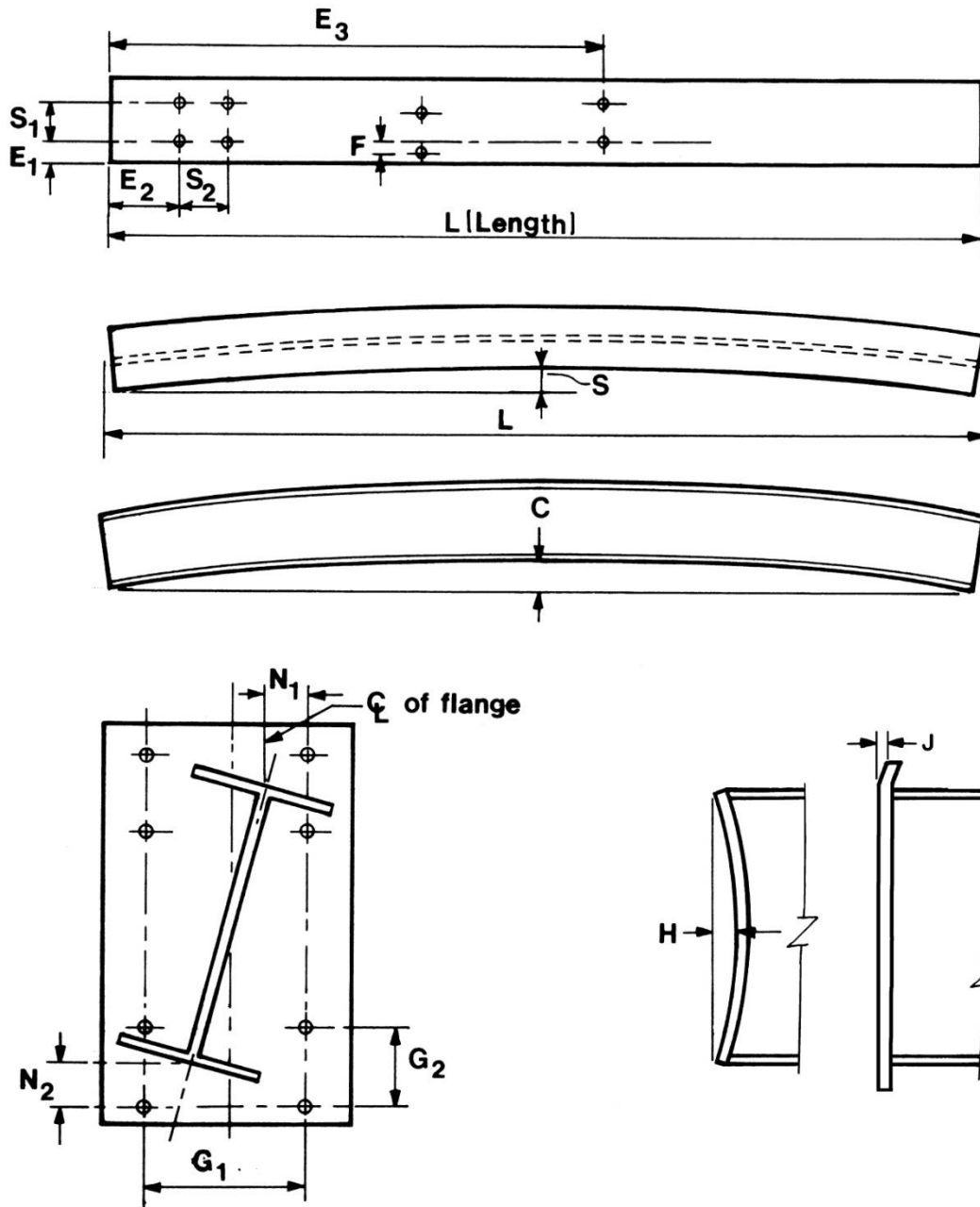
Figure 4.2(a)
Built-up Structural Member



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Figure 4.2(b)
Built-up Structural Member



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These criteria were previously issued April 2008, September 2008, May 2010, April 2011, August 2012, September 2013, February 2015, April 2017, June 2017, September 2018, October 2023, and Editorially revised January 2019.

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