



Iowa Department of Transportation

SPECIAL PROVISIONS FOR METAL FABRICATION

Clinton County
NHSX-030-9(134)--3H-23

Effective Date
January 18, 2012

THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

PART 1 GENERAL.

1.01 SUMMARY.

- A. This section includes all shop fabricated steel and aluminum items.

1.02 MEASUREMENT AND PAYMENT.

- A. Components:
 - 1. Basis of Measurement: Not Applicable - Incidental item
 - 2. Basis of Payment: Not Applicable - Incidental item

1.03 REFERENCES.

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2005.
- B. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2005.
- C. ASTM A 53/A 53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2005.
- D. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2002.
- E. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2005.
- F. ASTM A 283/A 283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2003.
- G. ASTM A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile

Strength; 2004.

- H. ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2004b.
- I. ASTM A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2003a.
- J. ASTM A 501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2001 (Reapproved 2005).
- K. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2004.
- L. ASTM B 210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2004.
- M. ASTM B 211 - Standard Specification for Aluminum & Aluminum-Alloy Bar, Rod and Wire; 2003.
- N. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2005a.
- O. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 1998.
- P. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2006.
- Q. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).
- R. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).
- S. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

1.04 SUBMITTALS.

- A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable. Shop drawings shall be certified by a Structural Engineer licensed in the State of Iowa.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- B. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

1.05 QUALITY ASSURANCE.

- A. Design structures under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Iowa.

PART 2 PRODUCTS.

2.02 MATERIALS - ALUMINUM.

- A. Extruded Aluminum: ASTM B 221 (ASTM B 221M), 6063 alloy, T6 temper.
- B. Sheet Aluminum: ASTM B 209 (ASTM B 209M), 5052 alloy, H32 or H22 temper.
- C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B 210 (ASTM B 210M), 6063 alloy, T6 temper.
- D. Aluminum-Alloy Bars: ASTM B 211 (ASTM B 211M), 6061 alloy, T6 temper.

- E. Bolts, Nuts, and Washers: Stainless steel.
- F. Welding Materials: AWS D1.1; type required for materials being welded.

2.03 FABRICATION.

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where otherwise noted.

2.05 FINISHES - ALUMINUM.

- A. High Performance Organic Coating System: Exterior Grade Powder Coat system, color as shown in contract documents.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of corrosion, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.

2.06 FABRICATION TOLERANCES.

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION.

3.01 EXAMINATION.

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION.

- A. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION.

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Obtain approval prior to site cutting or making adjustments not scheduled.

3.04 ERECTION TOLERANCES.

- A. Maximum Variation From Plumb: 1/4 inch per 15 feet, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

3.05 FIELD QUALITY CONTROL.

- A. Check final surface elevations for conformance to drawings.

3.06 CLEANING.

- A. Clean fabricated metal on site in accordance with the manufacturer's written recommendations.
- B. Remove all excess materials and debris from site.

3.07 PROTECTION.

- A. After work in this section is complete, the contractor shall be responsible for protecting work from damage due to subsequent construction activity on the site.