SP- 150060
(New)

SPECIAL PROVISIONS
FOR
HOT DIP GALVANIZING FOR STRUCTURAL STEEL

Ida County
NHSN-020-2(140)--2R-47

Effective Date
February 16, 2016

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

150060.01 DESCRIPTION.

A. Scope.
This work shall consist of surface preparation and hot dip galvanizing all structural steel specified on the plans. Structural steel shall be in accordance with Section 2408 of the Standard Specifications, except as described herein.

B. Approved Galvanizers.
Galvanized structural steel shall be furnished only from approved galvanizers identified in the Office of Construction and Materials Approved Products Database (MAPLE) Materials Approved Products Listing Enterprise, as specified in Materials I.M. 410.01, Appendix A. Galvanizers shall have a galvanizing tank and crane capable of accommodating the rolled beam sections shown on the plans. Additional beam splices beyond what is shown in the plans will not be allowed.

C. References.
The publications listed below form a part of this specification to the extent referenced. The publications are referred to within by the basic designation only.

1. American Society of Testing and Materials (ASTM).
- **a.** ASTM A325-14 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- **b.** ASTM A709-13a Standard Specification for Structural Steel for Bridges.
- **c.** ASTM A563-15 Standard Specification for Carbon and Alloy Steel Nuts.
- **d.** ASTM F436-11 Standard Specification for Hardened Steel Washers.
- **e.** ASTM A6-14 Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
- **f.** ASTM A123-13 Standard Specifications for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- **g.** ASTM A143-07(2014) Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

h. ASTM F2329-13 Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.
i. ASTM B695-04(2009) Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
j. ASTM A385-11e1 Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip).
k. ASTM A780-09(2015) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

2. Steel Structures Painting Council's Surface Preparation Specification (SSPC).
a. SSPC-SP1 – Solvent Cleaning.
b. SSPC-SP2 – Hand Tool Cleaning.
c. SSPC-SP3 – Power Tool Cleaning.
d. SSPC-SP6 – Commercial Blast Cleaning.
e. SSPC-SP7 – Brush-Off Blast Cleaning.
f. SSPC-SP8 – Pickling.

3. American Galvanizers Association.
Inspection of Products Hot Dip Galvanized After Fabrication.

150060.02 MATERIALS.

A. Structural Steel.
Structural steel shall be in accordance with ASTM A 709, Grade 50, except flange deflectors and beam erection seats may be Grade 36.

B. High Strength Fasteners.
Fasteners shall be ASTM A 325 Type 1 High Strength bolts, with ASTM A 563 Grade DH3 nuts and ASTM F 436 Type 1 washers, and shall be in accordance with Article 4153.06 of the Standard Specifications.

C. Hot Dip Galvanized Coating.
Galvanized coating properties shall be in accordance with ASTM A 123 for galvanizing of steel members and assemblies, and ASTM F 2329 for galvanizing of steel fasteners.

150060.03 CONSTRUCTION.

A. Fabrication Requirements.

1. To insure identification after galvanizing, piece marks shall be supplemented with metal tags for all items where fit-up requires matching specific pieces.

2. After fabrication (cutting, welding, drilling, etc.) is complete, all holes shall be deburred and all fins, scabs or other surface/edge anomalies shall be ground or repaired per ASTM A 6. The items shall then be cleaned per SSPC-SP1 and SSPC-SP6. All surfaces shall be inspected to verify no fins, scabs or other similar defects are present.

3. The contractor shall consult with the galvanizer to insure proper removal of grease, paint and other deleterious materials prior to galvanizing.

4. All bolt holes for field splices shall be drilled full size or sub-drilled and reamed to size. Bolt holes punched full size are not allowed.

B. Cleaning Structural Steel.
1. If rust, mill scale, dirt, oil, grease or other foreign substances have accumulated prior to

galvanizing, steel surfaces shall be cleaned by a combination of either:

- Caustic cleaning and cleaning according to SSPC-SP8, or
- Cleaning according to SSPC-SP1 and SSPC-SP6.

2. Special attention shall be given to the cleaning of corners and reentrant angles.

C. Surface Preparation and Hot Dip Galvanizing.

1. General.

a. Surfaces of the structural steel specified on the plans shall be prepared and hot dip galvanized as described herein.

b. For pier bearing assemblies, the pintle plates, keeper bars, masonry plates, and curved sole plates shall be galvanized. Pintles shall not be galvanized. All welding shall be completed prior to galvanizing. The surfaces of the pintle plate and masonry plate that are in contact with the neoprene pads and curved sole plate shall be free of projections due to galvanizing.

2. Surface Preparation.

a. A flux shall be applied to all steel surfaces to be galvanized. Top of beam top flange surfaces shall be galvanized, except within 2 inches of the stud locations to allow for field-installation of stud shear connectors.

b. The cleaned surfaces shall be galvanized within 24 hours after cleaning, unless otherwise authorized by the Engineer.

3. Application of Hot Dip Galvanized Coating.

a. Steel members, fabrications and assemblies shall be galvanized by the hot dip process in the shop in accordance with ASTM A 123.

b. Bolts, nuts, washers and steel components shall be hot dip galvanized in the shop in accordance with ASTM F 2329.

c. All steel shall be safeguarded against embrittlement in accordance with ASTM A 143. All galvanized steel work shall be handled in such a manner as to avoid any mechanical damage and to minimize distortion.

d. Beams and girders shall be handled, stored, and transported with their webs vertical and with proper cushioning to prevent damage to the member and coating. Members shall be supported during galvanizing to prevent permanent distortion.

e. All bolt holes shall be reamed or drilled to their specific diameters after galvanizing. All bolts shall be installed after galvanizing.

4. Hot Dip Galvanized Coating Requirements.

a. Coating weight, surface finish, appearance and adhesion shall conform to the requirements of ASTM A 385 and ASTM A 123 or ASTM F 2329, as appropriate.

b. Any high spots of zinc coating, such as metal drip lines and rough edges, left by the galvanizing operation in areas that are to be field connected shall be removed by cleaning per SSPC-SP2 or SSPC-SP3. The zinc shall be removed until it is level with the surrounding area, leaving at least the minimum required zinc thickness.

c. Shop assemblies producing field splices shall provide 1/8 inch minimum gaps between ends of members to be galvanized. At field splices of beams, galvanizing exceeding 0.08 inches on the cross-sectional (end) face shall be partially removed until it is 0.04 inches to 0.08 inches thick.

5. Testing of Hot Dip Galvanizing Coating.

a. Inspection and testing of hot dip galvanized coatings shall follow the guidelines provided in the publication “Inspection of Products Hot Dip Galvanized After Fabrication”. Sampling, inspection, rejection and retesting for conformance with requirements shall be according to ASTM A 123 or ASTM F 2329, as applicable. Coating thickness shall be measured according to ASTM A 123, for magnetic thickness gage measurement or

ASTM F 2329, as applicable.

b. All steel shall be visually inspected for finish and appearance.

c. Bolts, nuts, washers, and steel components shall be packaged according to ASTM F 2329. Identity of bolts, nuts and washers shall be maintained for lot-testing after galvanizing according to Article 4156.03, B, 4, f, 3.

6. Repair of Hot Dip Galvanized Coating.

a. Surfaces with inadequate zinc thickness shall be repaired in the shop in accordance with ASTM A 780 and ASTM A 123.

b. Surfaces of galvanized steel that are damaged after the galvanizing operation shall be repaired in accordance with ASTM A 780 whenever damage exceeds 3/16 inches in width and/or 4 inches in length. Damage that occurs in the shop shall be repaired in the shop. Damage that occurs during transport or in the field shall be repaired in the field.

7. Construction Requirements.

If white rust is visible on the contact surfaces for any field connections, the steel surface shall be hand wire brushed or cleaned according to SSPC-SP7. Power wire brushing is not allowed.

150060.04 METHOD OF MEASUREMENT.

The method of measurement for Structural Steel, Galvanized will be the quantity, in pounds, shown in the contract documents. The weight of structural steel measured for payment shall be as described in Article 2408.04 of the Standard Specifications. The weight of galvanizing coatings will not be measured.

150060.05 BASIS OF PAYMENT.

Payment shall be as described in Article 2408.05 of the Standards Specifications. In addition, payment is full compensation for:

- Cleaning, surface preparation and hot dip galvanizing of structural steel.
- Repair of galvanizing at the shop and after erection.
- Incidentals to complete the structure.