

SECTION 050513
FACTORY-APPLIED COATING FOR METAL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. This Section specifies factory-applied metal coatings including the following:**
- B. Hot-dip galvanizing and high-performance super durable thermosetting based coating for iron and steel fabrications.

1.02 RELATED SECTIONS

- A. Examine Contract Documents for requirements that affect Work of this Section. Other Specification Sections that directly relate to Work of this Section include, but are not limited to:
- B. Section 051200 - Structural Steel Framing.
- C. Section 055000 - Metal Fabrications.
- D. Colors, finishes, and textures: Section 09 06 00, SCHEDULE FOR FINISHES.
- E. Prime and finish painting: Section 09 91 00, PAINTING

1.03 SUBMITTALS

- A. Product Literature for Factory-Applied Metal Coatings: Submit galvanizer's product literature for coatings specified in this Section including test data.
- B. Verification Samples for Factory-Applied Metal Coatings: Submit two 3 inch by 6 inch samples of factory-applied coatings and colors proposed for use for approval prior to coating application.
- C. Certificate of Compliance for Items Coated by Galvanizer: If requested, submit notarized Certificate of Compliance with application for payment for galvanizing, signed by the galvanizer, indicating compliance with requirements of specifications. Include scope of services provided, and quantity and itemized description of items processed.
- D. Certificate of Compliance for Shop Drawing Review by Galvanizer: If requested, submit galvanizer's certification that shop drawings for metal fabrications to receive metal coatings have been reviewed and that fabrications are acceptable to galvanizer for proper application of galvanizing and metal coatings. All drawings shall be signed by the galvanizer to indicate acceptance of design for galvanizing.
- E. Certificate of Compliance of Item Identification by Galvanizer: The galvanizer shall mark all lots of material with a clearly visible tag indicating the name of the galvanizer, the type and weight of the coating, and the applicable ASTM standards. If requested, submit certification of compliance that items have been tagged.
- F. Substitutions: If substitutions or other products are proposed, submit this specification signed by the firm proposing the other products, indication line-by-line comparison of the proposed substitution or equal product with test results. Substitutions proposed with comparison test results will not be accepted.
- G. Galvanizer's written Quality Control/Quality Assurance manual for hot dip galvanizing and factory applied coating.

- H. Certification from the American Galvanizers Association that Galvanizer has completed all course requirements and is a certified Master Galvanizer

1.04 QUALITY ASSURANCE

- A. Galvanizer' Qualifications: Engage the services of a qualified galvanizer who has demonstrated a minimum of ten years experience in the successful application of galvanized coatings specified in this specification in the facility where the work is to be performed and who will apply the coatings within the same facility.
- B. Coating Applicator's Qualifications: Galvanizing and factory-applied coatings shall be performed by a company with a minimum of ten years experience in the successful application of hot-dip galvanizing utilizing the dry kettle process.
- C. Pre-Construction Conference for Metal Fabrications to Receive Factory-Applied Metal Coatings: Contractor shall schedule a meeting to be attended by Contractor, Architect, fabricator, and galvanizer. Agenda shall include the following: Project schedule, scope of services, coordination between fabricator and galvanizer, finish of surfaces, application of coatings, color selections, submittals, and approvals.
- D. Coordination between Fabricator and Galvanizer: Prior to fabrication and final submittal of shop drawings to Architect, direct fabricators to submit shop drawings to the galvanizer for all metal fabrications to receive factory-applied metal coatings. Direct galvanizer to review fabricator's shop drawings for suitability of materials for galvanizing and coatings and coordinate any required modifications to fabrications required to be performed by the fabricator.
- E. Environmental Compliance: Coatings shall be certified OTC/VOC compliant and conform to EPA standards and local regulations.

PART 2 - PRODUCTS

2.01 HOT DIP GALVANIZING AND HIGH PERFORMANCE SUPER DURABLE THERMOSETTING BASED COATING

- A. Hot-Dip Galvanizing: For steel exposed to the elements, weather or corrosive environments and other steel indicated to be galvanized, provide coating for iron and steel fabrications applied by the hot-dip process. Galvanizing bath shall contain special high grade zinc and other earthy materials.
 - 1. Basis-of-Design: Duragalv by Duncan Galvanizing or others meeting requirements of this specification.
 - 2. Comply with ASTM A 123 for fabricated products and ASTM A 153 for hardware.
 - 3. Provide thickness of galvanizing specified in referenced standards.
 - 4. Fill vent holes after galvanizing, if applicable, and grind smooth.
 - 5. Galvanizing shall exhibit a rugosity (smoothness) 4 rug or less (16-20 microns of variation) when measured by a profilometer over a 1 inch straight line on the surface of elements that are less than 24 pounds per running foot. Profilometer shall be capable of operating in 1 micron increments.
- B. High-Performance Thermosetting Based Coating: Provide coating matching approved samples. Factory-applied metal coatings shall be applied in a facility acceptable to the coating manufacturer. Factory applied coating shall include an architectural grade primer. Full cure of the coating system shall be verified by the coating manufacturer's recommended test methods.

Coatings must meet or exceed the criteria for the following categories as stipulated by the coatings manufacturer. All testing was performed on lab prepared panels.

1. Basis-of-Design: Duncan Colorgalv ThermosetSM by Duncan Galvanizing or others meeting requirements of this specification.
2. Coating shall meet or exceed the following criteria as established by the coating manufacturer.
 - a. Adhesion: ASTM D 3359, no loss.
 - b. Hardness: ASTM D 3363 (pencil), H min.
 - c. Falling Sand: ASTM D 968 20L/mil.
 - d. Salt Spray: ASTM B 117, passes 3000 hrs.
 - e. Humidity: ASTM D 2247, 3000 hours, few #8 blisters.
 - f. Impact Resistance (3mm): ASTM D 2794, no loss.
 - g. Color Retention: ASTM D 2244, 5 year less than or equal to 5 delta E.
 - h. Chalk Resistance: ASTM D 4214, #8 rating.
 - i. Gloss Retention: ASTM D 523, greater than or equal to 30 percent retention.
 - j. Erosion Resistance: ASTM B 244, less than 10 percent film loss.
 - k. Compliance: AAMA 2604.
3. Color shall be as selected by architect in a "semi-gloss" finish
4. Warranty: Provide galvanizer's standard warranty that materials will be free from 10 percent or more visible rust for 20 years.

PART 3 - EXECUTION

3.01 APPLICATION OF FACTORY-APPLIED METAL COATINGS

- A. **Galvanizing Application:** Galvanize materials in accordance with specified standards and this specification. Galvanizing shall provide an acceptable substrate for applied coatings. The dry kettle process shall be used to eliminate any flux inclusions on the surface of the galvanized material.
- B. Prior to galvanizing, the steel shall be immersed in a pre-flux solution (zinc ammonium chloride). The pre-flux tank must be 12 to 14 Baumé density and contain less than 0.4 percent iron. Use of the wet kettle process is not acceptable. To provide the galvanized surface required, the following procedures shall be implemented:
 1. A monitoring recorder shall be utilized and inspected regularly to observe any variances in the galvanizing bath temperature.
 2. The pickling tanks shall contain hydrochloric acid with an iron content less than 8 percent and zinc content less than 3 percent. Titrations shall be taken weekly at a minimum.
 3. All chemicals and zinc shall be tested at least once a week to determine compliance with ASTM standards. All testing shall be done using atomic absorption spectrometry or x-ray fluorescence (XRF) equipment at a lab in the galvanizing plant.
- C. Finish coatings shall be applied under the following conditions.
- D. Minimum air temperature shall be 65 degrees F. Surface temperature of steel shall be 60 degrees to 95 degrees F and, in any event, be 5 degrees F higher than the dew point. Humidity shall be 85 percent maximum.
- E. The use of iron or steel shot and sand and aluminum oxide grit as a blast medium, and power wire brushes are not permitted.

- F. Surface of substrate shall be dry and free from dust, dirt, oil, grease or other contaminants. Coating and cure facility shall be maintained free of airborne dust and dirt until coatings are completely cured.

3.02 INSTALLATION

- A. **Installation:** Comply with fabricator's and galvanizer's requirements for installation of materials and fabrications, including use of nylon slings or padded cables for handling factory-coated materials.
- B. **Touch-Up and Repair:** For damaged and field-welded metal coated surfaces, clean welds, bolted connections and abraded areas.
 - 1. For galvanized surfaces, apply organic zinc repair paint complying with requirements of ASTM A 780, modified to 95 percent zinc in dry film. Galvanizing repair paint shall have 95 percent zinc by weight, ZiRP by Duncan Galvanizing. Thickness of applied galvanizing repair paint shall be not less than coating thickness required by ASTM A 123 or A 153 as applicable. Touch-up of galvanized surfaces with silver paint, brite paint, or aluminum paints is not acceptable.
 - 2. For factory-applied finish coatings, field-touch-up shall be performed by factory approved personnel for warranties to apply. Touch-up shall be such that repair is not visible from a distance of 6 feet. If non factory-approved technicians are used for field touch-up, no warranties shall exist.
 - 3. A touch-up repair kit or touchup instructions shall be provided to the Owner for each type of factory-applied finish.

--END OF SECTION--