



# Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

June 1, 2023

SUBJECT: FAP Route 801 (IL 10)  
Project NHPP-550N(100)  
Section 4BR  
Champaign County  
Contract No. 70581  
Item No. 42, June 16, 2023 Letting  
Addendum A

## NOTICE TO PROSPECTIVE BIDDERS:

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

1. Revised the Schedule of Prices.
2. Revised page ii of the Table of Contents to the Special Provisions.
3. Added pages 95-98 to the Special Provisions.
4. Revised sheet 7 of the Plans.

Prime contractors must utilize the enclosed material when preparing their bid and must include any changes to the Schedule of Prices in their bid.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Jack A. Elston'.

Jack A. Elston, P.E.  
Bureau Chief, Design and Environment

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## **POWDER COATING OF PARAPET AND BRIDGE FENCE RAILING**

### Description

This work shall include surface preparation, vinyl, polyolefin or powder type painted finish application and packaging of new galvanized railing and fence system assemblies. All work associated with applying the painted finish shall be performed at the manufacturing facility for the fence system assembly or railing assembly or at a painting facility approved by the Engineer. After installation of railing or fence system in the field, the color of all visually exposed surfaces of all connector hardware shall be touched up using material as recommended by the galvanizer and the powder coating supplier to match the black powder coating that was applied to all other metal elements of the railing systems.

This work shall conform to Section 509 of the Standard Specifications with the additional work specified herein and as shown on the plans.

### Materials

Materials shall meet the requirements of Article 509.02 of the Standard Specifications, and as specified below.

### Fence Fabric

The fabric shall be woven in 2 inch mesh with 0.148 inch diameter wire meeting the requirements of AASHTO M181, Type IV, Class B (polyvinyl chloride PVC) or ASTM F668 Class 2b (polyvinyl chloride PVC or polyolefin elastomer) coated steel.

### Fence Coating

The tension wire and fabric ties shall be vinyl or polyolefin coated.

### Galvanizing

The posts, post tops, base and cap plates, railings, braces, stretcher bars, fittings and hardware shall be powder coated. All materials to be powder coated shall be hot dipped galvanized in accordance with Articles 1006.27, 1006.28 and 1006.34 of the Standard Specifications and ASTM A123 with a minimum zinc coating of 0.90 ounces per square foot (G90) after fabrication and prior to vinyl, polyolefin, or powder coating. Vent holes for galvanizing shall be placed in the posts and rails at locations that will not allow the accumulation of moisture in the members. Only the dry-kettle (pre-fluxing) process shall be used. The material shall not be water or chromate quenched. Galvanized materials to be powder coated shall be air cooled only. An American Galvanizers Association trained Master Galvanizer shall be on the premises during the hot dipped galvanizing process.

### Powder

Powder coating material shall be a thermosetting, durable, TGIC polyester powder of a degassing grade. Such coating powder must be recommended by its manufacturer for use over hot dipped galvanizing. The coating powder's particle size distribution shall be recommended by its manufacturer to produce the best results for powder coating components under this specification.

Added June 1, 2023

### Surface Preparation

All primary components of railing systems: posts, post tops, base and cap plates, railings, braces, stretcher bars, and fittings shall receive a pre-treatment process that cleans and prepares the galvanized surface to assure complete adhesion of the powder coating after drilling and layout, to ensure maximum corrosion protection. The zinc surface shall be prepared for powder coat application using a multistage system employing appropriate cleaners and imparting a phosphate conversion coat to provide an appropriate substrate for the

powder coat material. During the cleaning process, water rinses shall be used as appropriate between stages to clean the items and prepare them for the subsequent stages. Water for the rinses, unless specified elsewhere shall be potable with a hardness not to be more than 250 ppm as CaCO<sub>3</sub> and a combined chloride and sulfate level less than 100 ppm.

### Surface Defects

All weld flux and other contaminants shall be mechanically removed. All drainage spikes, tears, high spots, protrusions or other surface defects shall be removed using hand or power tools in accordance with the manufacturer's specifications. Such operations shall not remove the galvanized coating below the thickness allowed by ASTM A123. Thickness of the galvanizing shall be verified using a properly calibrated magnetic thickness gauge as per ASTM E376. Any item falling below the required zinc thickness, before or after removal of any high spots, shall be repaired in accordance with Practice A780.

### Surface Cleaning

The galvanized surface shall be clean and free of oils and grease before they are powder coated. These shall be removed by use of an aqueous alkaline solution and/or hand or power tool cleaning. Subsequent to alkaline/power cleaning, trace zinc oxide will be removed by a mild acidic solution.

An alkaline solution, pH in the range of 11 to 12 may be used to remove traces of oil, grease, or dirt. The alkaline solution shall not have a pH exceeding 13. After cleaning the piece shall be rinsed thoroughly in water under pressure.

Hand or power tool cleaning may be used to clean light deposits of zinc reaction products such as wet storage stain, as specified to SSPC Surface Preparation Specification 2 or 3 as appropriate.

An acidic solution with a pH of 3.5 to 4.5 shall be sprayed onto the item to remove residual zinc oxide.

### Surface Profiling

The galvanized surface shall be profiled to promote proper powder coating adhesion. This shall be accomplished by applying a phosphate treatment to create a protective crystalline phosphate conversion coating on the zinc surface. The coating shall have a coating weight between 20 to 70 mg/ft<sup>2</sup>.

### Final Rinse

To ensure the most optimum performance possible, a final rinse of de-mineralized water shall be applied as a final rinse prior to pre-baking. This stage will remove any un-reacted phosphate and other contaminants.

Added June 1, 2023

Powder Coat Application

The finish color shall be one of the manufacturer's standard colors and shall be as selected by the local agency responsible for paint costs. The Contractor shall confirm, in writing, the color selection with the local responsible agency and provide a copy of the approval to the Engineer and a copy of the approval shall be included in the material catalog submittal. The City desires a smooth powder black finish.

Color

The color of all vinyl, polyolefin or polyester powder coatings on fence metal fabric, posts, post tops, base and cap plates, railings, braces, stretcher bars, fittings, hardware, and accessories shall be a smooth powder black finish.

Pre-baking

Following phosphating all items to be powder coated shall be placed in an oven capable of maintaining a temperature of 500°F. Specimens shall be baked at a temperature 25°F above the normal cure temperature for the powder that will be employed. The specimens shall remain in the oven for a minimum of 20 minutes after having equalized to the temperature of the oven to remove any residual moisture from the preparation phase, and insure expulsion of any entrapped gases or moisture. Typically, specimens are pre-baked for one hour.

Powder Coat Application

Polyester powder shall be applied through electrostatic/tribomatic application guns. The powder shall be applied in multiple coats. The first coat shall have a thickness of 1.5 to 3 mils. Each intermediate coat shall be partially cured at a temperature of 350°F to insure adhesion. Subsequent coats shall be then applied in 1.5 to 3 mil increments to bring the specimen to its final (cured) thickness as required by the customer specification. In no case will the final (cured) thickness be less than 5 mils.

Cure

The powder coating shall be cured by heating the coated specimens to a temperature and duration specified by the powder coat material manufacturer to insure sufficient curing of the powder coating material. The resulting coating shall be uniform in color and free of pinholes, blisters, and other surface defects. Correct cure shall be checked by a solvent rub test.

Properties of Cured Coating:

• Minimum film thickness	TGIC	5.0 mils (120um)
• Direct impact	ASTM D 2794	160 in./lb (9.0 m/kg)
• Reverse impact	ASTM D 2794	160 in./lb (9.0 m/kg)
• Pencil hardness (scratch/gouge)	ASTM D 383	2H
• Flexibility (Mandrel test)	ASTM D 522	1/8 in. (3m mm)
• Minimum adhesion	ASTM D 3359	5A,5B (100% crosshatch)
• Salt spray	ASTM B 117	+1000 hrs < 2mm

Added June 1, 2023

#### Repair of Powder Coated Material

- Damage shall be defined as exposed galvanized coating.
- Damaged coatings less than ½ of 1% of the surface area shall be acceptable for repair.
- Damage greater than that amount shall be recoated. Final finish shall be damage free FOB the plant.
- Coatings to be repaired shall be touched up as recommended by the galvanizer and the powder coating supplier. Touch up and/or field repair can be accomplished using either powder coating material or paint. Typically, acrylic based paint as recommended by the powder coating material manufacturer, applied either by spray or brushed on liquid is used for touch up and repair of the powder coating.

Any damage to the finish after leaving the manufacturer's facility shall be repaired to the satisfaction of the Engineer using a method approvable by the Engineer and manufacturer. If while at the manufacturer's facility the finish is damaged, the finish shall be re-applied.

#### Packaging

Prior to shipping, the new railing and fence system assemblies including fence metal fabric, posts, post tops, base and cap plates, railings, braces, stretcher bars, fittings, hardware, and accessories shall be wrapped in ultraviolet-inhibiting plastic foam or rubberized foam.

#### Submittals

In addition to the requirements of Article 509.04 of the Standard Specifications, the Contractor shall provide certification for the following:

The galvanized element surfaces were properly prepared for adhesion of powder coat.  
The connector hardware was properly prepared for adhesion of field-applied paint.  
Polyester Powder was applied at a rate of 1.5 to 3 mils and properly cured per the manufacturer's recommendations.

#### Warranty

The Contractor shall furnish in writing to the Engineer, the paint manufacturer's standard warranty and certification that the paint system has been properly applied.

Basis of Payment. This work shall be paid for at the contract Lump Sum price for POWDER COATING OF PARAPET RAILING AND BRIDGE FENCE RAILING, which shall be payment in full for surface preparation and powder coat application to all galvanized metal elements of the railing systems including posts, post tops, base and cap plates, railings, braces, stretcher bars, fittings, hardware, and accessories. This payment shall also include vinyl or polyolefin coat application to fence metal fabric and the packaging of new railing and fence system assemblies as described in this specification.

Added June 1, 2023