



**SPECIAL PROVISIONS
FOR
SAFETY RAIL**

**Linn County
TAP-U-1187(801)--8I-57**

**Effective Date
August 18, 2026**

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

236080.01 DESCRIPTION.

A. General.

This item involves supplying and installing the safety rail as indicated on the contract documents and referenced within the following specifications.

B. Submittals.

1. Material and Equipment List.

Submit color samples and product literature for primer, paint, and powder coating to be used on the safety rail.

2. Shop Drawings.

Submit shop drawings for safety rail.

236080.02 MATERIALS.

A. Safety Rail.

1. Rails and Posts.

Provide 2 ½ inch by 2 ½ inch tubular high strength steel with ¼ inch minimum wall thickness. Comply with ASTM A 500, Grade B.

2. Pickets.

Provide 1 inch by 1 inch tubular high strength steel with 1/8 inch minimum wall thickness. Comply with ASTM A 500, Grade B.

B. Finish.

1. Powder Coated Finish.

Apply black powder coat to steel, galvanized steel, or aluminum safety rail. Comply with the

manufacturer's recommendations for surface preparation, application of primer, and application of the powder coating, in addition to the following minimum requirements.

2. Surface Preparation.

a. Steel Substrate.

- 1) Remove oils and surface contamination by solvent cleaning. Comply with the requirements of SSPC-SP 1. Rinse thoroughly with hot water or water pressure and dry completely.
- 2) Remove loose rust, loose mill scale, and other foreign substances by hand or power tool cleaning. Comply with SSPC-SP 2 or 3.
- 3) Remove all dirt, grease, rust scale, mill scale, paint, slag, and other foreign substances by blast cleaning. Comply with SSPC-SP 6.
- 4) Remove all blast cleaning products by means of vacuuming or compressed air.
- 5) Chemically clean surface to remove residual contamination, apply conversion coating, and apply sealing agent to prepare the surface for powder coating.
- 6) Begin powder coating as soon as possible after surface preparation to prevent the development of iron oxide on the surface of the steel.

b. Galvanized Steel Substrate.

- 1) Remove all tears, spikes, high spots, or other surface defects caused by the galvanizing process using hand or power tools.
- 2) Apply an alkaline solution, with a pH between 11 and 12, to remove traces of oil, grease, and dirt.
- 3) Remove residual zinc oxide by spraying surface with a mild acidic solution (pH of 3.5 to 4.5).
- 4) Apply conversion coating to the surface and apply sealing agent to prepare the surface for powder coating.

c. Aluminum Substrate.

- 1) Clean surface by power washing to remove contaminants.
- 2) Clean surface with an aqueous alkaline solution by immersion or scrubbing with a soft brush. Do not scrub with a steel bristle brush. Dry completely after cleaning.
- 3) Remove oils and surface contamination by solvent cleaning. Comply with the requirements of SSPC-SP 1.
- 4) Remove light deposits of aluminum reaction by-products by hand or power tool cleaning. Comply with SSPC-SP 2 or 3.
- 5) Remove aluminum oxide by sweep blasting or chemical treatment:
 - a) Sweep Blasting.**
 - (1) Utilize oil-free compressed air to prevent contamination of cleaned surface.
 - (2) Utilize blast media with a MOH hardness of 5 or less, or utilize organic media such as corn cobs or walnut shells. Do not roughen surface.
 - (3) Powder coat surface within 60 minutes of sweep blasting to prevent reformation of aluminum oxide.
 - b) Chemical Treatment.**

Comply with ASTM D 1730 for Type B treatment.
- 6) Chemically clean surface to remove residual contamination, apply conversion coating, and apply sealing agent to prepare the surface for powder coating.

3. Priming.

Apply as recommended by coating manufacturer for specific substrate to all surfaces, unless specifically not required by coating manufacturer.

4. Coating.

a. General.

- 1) Provide complete multi-coat systems formulated and recommended by the manufacturer for the application indicated.
- 2) Provide urethane, TGIC polyester, polyester wrinkle, or non-TGIC polyester based powder coatings as recommended by the powder coating manufacturer to provide long

term exterior durability.

b. Application.

- 1) Apply coating to the thickness specified by the coating manufacturer. Comply with coating manufacturer's recommendations for application of powder coating.
- 2) Apply coating in uniform thickness coats without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

c. Curing.

Cure the powder coating at the temperature and for the time recommended by the powder coating manufacturer.

C. Bolted Connection.

1. **Anchor Plate:** ¼ inch thick, 6 inch by 6 inch steel anchor plate with a 46,000 psi yield strength. Paint or galvanize anchor plate to match handrail or safety rail.
2. **Bolts:** Provide 3/8 inch galvanized anchor bolts or threaded rod with length as required to provide a 3 inch embedment. Comply with ASTM A 36.
3. **Adhesive Anchoring Material.**
 - a) Epoxy complying with ASTM C 881, Type IV. Provide appropriate epoxy class based upon concrete temperature at time of installation.
 - b) Grout on approved products list in Iowa DOT Materials I.M. 491.11, Appendix C.

236080.03 CONSTRUCTION.

A. Safety Rail.

1. **General.**
 - a. Install rail continuously with no gaps or breaks along the length specified in the contract documents.
 - b. Use welded connections between rail components. Grind connections to remove sharp or abrasive edges and to remove other irregularities.
2. **Rails.**
Install the top rail a minimum of 42 inches above the finished grade. Install the bottom rail a maximum of 4 inches above finished grade.
3. **Pickets**
Located pickets in the center of the top and bottom rails and space evenly between posts. Provide a maximum clear opening between pickets of 4 inches.

B. Posts.

1. Bolted Connection:

- a. Weld anchor plate to the bottom of the handrail posts.
- b. Layout location and drill four 7/16 inch holes for anchor bolts at each post attachment point. Drill holes with a carbide drill bit; do not core drill anchor bolt holes.
- c. Apply adhesive anchoring material according to manufacturer's published recommendations and install threaded rod or anchor bolts.

236080.04 METHOD OF MEASUREMENT.

Safety Rail shall be per linear foot for safety rail, measured along the top of the safety rail from end post to end post.

236080.05 BASIS OF PAYMENT.

Safety Rail will be paid at the contract unit price per linear foot for safety rail installed. Unit price includes, but is not limited to, the furnishing and installation of all posts, pickets, mounting hardware, epoxy grout, finishing, and all other parts as detailed on the safety rail detail and shall be considered incidental to this item. Furnishing all materials, labor, equipment, and other incidental items necessary to meet the requirements of the contract documents.