SPECIAL PROVISIONS
FOR
SAFETY RAIL

Scott County
STP-U-006-9(80)--70-82

Effective Date
November 15, 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.

150151.01 GENERAL.

A. Description of Work.
This part of the Specifications includes all labor, materials, transportation, tools, equipment, fabrication and supervision required to furnish and install a Safety Rail in accordance with the contract documents.

B. Submittals.

1. Submit duplicate color samples and product literature for powder coating to be used on safety rail.

2. Submit duplicate shop drawings: indicate profiles, sizes, finish, connection attachments, anchorage, size and type of fasteners, expansion joints, and accessories.

C. Special Requirements.

1. Provide 1 gallon of color matched exterior grade polyurethane paint for the Contracting Authority's maintenance use.

2. Label gallon container with the manufacturer's name, product number, and color number.

3. Railing assembly shall withstand a minimum concentrated load of 200 pounds applied vertically downward or horizontally in any direction, but not simultaneously, at any point on the top rail, unless otherwise required by governing code.

4. Components and installation are to be in accordance with state and local code authorities.

150151.02 MATERIALS.

A. Safety Rail.

1. Rails and Posts: 2 inch diameter; ensure post diameter matches handrail diameter.

2. Steel: Welded or seamless standard weight black steel pipe and posts complying with ASTM A 53, Grade A or B.

B. Finish.

Comply with applicable portions of Section 2508 of the Standard Specifications and the following:

1. Powder Coated, Brown Color. Comply with the manufacturer's recommendations for surface preparation, application of primer, and application of the powder coating, in addition to the following requirements.

a. Surface Preparation.

1) Remove oils and surface contamination by solvent cleaning. Comply with the requirements of SSPC-SP1. 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. Priming: Apply as recommended by coating manufacturer for specific substrate to all surfaces, unless specifically not required by coating manufacturer.

c. Coating.

1) General.

a) Provide complete multi-coat systems formulated and recommended by the manufacturer for the application indicated.

b) 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.

2) Application.

a) Apply coating to the thickness specified by the coating manufacturer. Comply with coating manufacturer's recommendations for application of powder coating.

b) 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.

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

C. Attachment.

1. Surface Mounted (Bolted Connection): Materials shall comply with Article 4153.06 of the Standard Specifications as applicable, and the following

a. Anchor Plate: 1/4 inch thick, 5 inch by 8 inch steel anchor plat with a 46,000 psi yield strength. Paint anchor plate to match safety rail.

b. 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. The exposed portion of the bolts or rods shall be painted to match safety rail and anchor plate.

c. Adhesive Anchoring Material.

1) Epoxy complying with ASTM C 881, Type IV. Provide appropriate epoxy class based upon concrete temperature at time of installation.
2) Grout on approved products list in Materials I.M. 491.11, Appendix C.

2. Embedded.
a. Polymer Grout: Comply with Materials I.M. 491.11
b. Non-Shrink Grout: Comply with Materials I.M. 491.13.
c. Concrete: Iowa DOT Class C
d. Embedded posts shall have a 1/4 inch weep hole at 1/2 inch above flange.

D. Fabrication.

1. Verify dimensions on site prior to shop fabrication.

2. Accurately form railing configuration to suit specific project conditions and for proper connection to structural substrate.

3. Fit and shop assemble components in largest practical sizes for delivery to site.

4. Fabricate components with joints tightly fitted and secured.

5. Provide anchors and plates, as required.

6. Exposed Mechanical Fastenings: Provide flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

7. Supply components required for anchorage of railings. Fabricate anchors and related components of same material and finish as railings, except where noted otherwise.

8. Accurately form components for proper fit in field.

9. Accommodate for expansion and contraction without damage to connections or members.

10. Close exposed ends of pipe by use of appropriate end cap.

150151.03 CONSTRUCTION.

A. Installation of Rail.

1. General: Comply with Article 2414.03, E, 2 of the Standard Specifications and the following:
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 remove other irregularities.
c. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

2. Safety Rail.
a. Rails: Install the top rail a minimum of 42 inches above the finished grade. Install the bottom rail a maximum of 4 inches above the finished grade.
b. Pickets: Locate 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.

3. Posts: Install posts at a maximum spacing of 8 feet. Attached in one of the following two ways, as noted in drawings:
a. Embedded.

1) Form a 10 inch diameter by 42 inch deep hole and place sleeve or insert (compatible material to post) in center, once secure, pour concrete around sleeve. Post will need to fit securely in this sleeve. Sleeve shall be embedded a minimum of 3 feet. Alternatively, a hole may be core drilled in hardened concrete.

2) After the concrete hardens and sleeve is secure, set railing posts into sleeves/holes and temporarily secure.

3) Fill the gap between the post and sleeve/hole with non-shrink or polymer grout.

b. Bolted Connections.

1) Weld anchor plate to the bottom of the safety rail posts.

2) 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.

3) Apply adhesive anchoring material according to manufacturer's published recommendations and install threaded rod or anchor bolts.

B. Erection Tolerances.

1. Maximum Variation From Plumb: 1/4 inch in 10 feet.

2. Maximum Offset From True Alignment: 1/4 inch.

3. Maximum Out-Of-Position: 1/4 inch.

C. Repair of Defective Work.

1. Remove stained or otherwise defective work and replace with material that meets specifications.

2. Repair damaged finish as directed by Contracting Authority.

3. Replace defective or damaged components as directed by Contracting Authority.

150151.04 METHOD OF MEASUREMENT.

A. Safety Rail, Embedded.

1. Measurement will be in linear feet for Safety Rail, Embedded, measured along the top of the safety rail from embedded end post to halfway between the last embedded post and the first surface mounted post. Measurement will be to the nearest 0.5 foot.

2. There will be no overlap in measurements of embedded safety rail with the measurements of the surface mounted safety rail.

B. Safety Rail, Surface Mounted.

1. Measurement will be in linear feet for Safety Rail, Surface Mounted, measured along the top of the safety rail from surface mounted end post to halfway between the last surface mounted post and the first embedded post. Measurement will be to the nearest 0.5 foot.

2. There will be no overlap in measurements of surface mounted safety rail with the measurements of the embedded safety rail.

150151.05 BASIS OF PAYMENT.

A. Safety Rail, Embedded.

1. Payment will be at the unit price per linear foot of Safety Rail, Embedded, rounded to the

nearest 0.5 foot.

2. Payment is full compensation for furnishing all materials, tools, supervision and labor for the performance of all work that is necessary to fabricate and install the safety rail in accordance with the contract documents. This includes but is not limited to, excavation and material required for post footings, posts, rails, pickets, mounting hardware, epoxy grout, and preparation and finishing (powder coat) complete safety rail and the associated components.

3. **Incidental Items.**
   - **a.** Items not listed as specific bid items, but required for proper completion of the work are incidental to construction.
   - **b.** No separate payment will be made for excavation, concrete, epoxy, or any other item or work required for embedding the posts, or prepping the railing and components for powder coating.
   - **c.** No separate payment will be made for testing, certifications and permits that may be required.
   - **d.** Incidental items may or may not be shown on plans.
   - **e.** No payment shall be made for incidental items.

B. Safety Rail, Surface Mounted.

1. Payment will be at the unit price per linear foot of Safety Rail, Surface Mounted, rounded to the nearest 0.5 foot.

2. Payment is full compensation for furnishing all materials, tools, supervision and labor of all work necessary to fabricate and install the safety rail in accordance with the contract documents. This includes but is not limited to, posts, rails, pickets, mounting hardware, epoxy grout, and preparation and finishing (powder coat) complete safety rail and the associated components.

3. **Incidental Items.**
   - **a.** Items not listed as specific bid items, but required for proper completion of the work are incidental to construction.
   - **b.** No separate payment will be made for surface mounting hardware, drilling, or any other item or work required for surface mounting the posts.
   - **c.** No separate payment will be made for testing, certifications and permits that may be required.
   - **d.** Incidental items may or may not be shown on plans.
   - **e.** No payment shall be made for incidental items.