



# Iowa Department of Transportation

## SPECIAL PROVISIONS

FOR

## ALUMINUM HANDRAIL

Greene County  
STP-E-3800(601)--8V-37

Effective Date  
July 19, 2011

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS AND GENERAL SUPPLEMENTAL SPECIFICATIONS.

## **1.0 GENERAL.**

### **1.01 WORK INCLUDED.**

- A.** Supply all materials, labor and equipment necessary to provide all aluminum handrail assembled and installed complete as specified herein and detailed in project drawings.

### **1.02 DESCRIPTION.**

- A.** Any ramp which has a rise greater than 6 inches or a horizontal projection of greater than 72 inches will have handrail on both sides. All handrails shall comply with Section 4.8.5 of the Americans with Disabilities Act.
- B.** Any ramp with a drop off of 30 inches shall have a guardrail with infill panel with openings such that a 4 inch maximum diameter sphere cannot pass through, and an ADA compliant handrail attached at a height of 34 inches to 38 inches from the operating surface
  - 1.** See Aluminum handrail specification for details of the infill panel system.

### **1.03 REFERENCES.**

- A.** American National Standards Institute (ANSI).
  - 1.** A21.1 Safety requirements for floor and wall openings, railings and toe boards.
  - 2.** A58.1 Minimum design loads in buildings and other structures.
  - 3.** A117.1 Accessible and usable buildings and facilities.
- B.** American Society for Testing and Materials (ASTM)
  - 1.** E894 Standard test methods for anchorage of permanent metal railing systems and rails for buildings.
  - 2.** E935 Standard test methods for performance of permanent metal railing systems and rails for buildings.
  - 3.** E985 Specifications for permanent metal railing systems and rails for buildings.
- C.** Americans With Disabilities Act Guidelines (ADAAG)
- D.** National Association of Architectural Metals Manufacturers (NAAMM)
  - 1.** Metal Finishes Manual
  - 2.** Pipe Railing Manual
  - 3.** Stair Manual

### **1.04 PERFORMANCE.**

- A.** Handrail shall conform to apply to pertinent sections of the following codes:
  - 1.** OSHA
  - 2.** ADAAG – Americans with Disabilities Act Accessibility Guidelines
  - 3.** Applicable state and local building codes, including IBC, BOCA, UBC, etc.
- B.** Load – Handrail shall be designed and installed to withstand a concentrated load of 250 pounds applied anywhere on throughout the system.

- C. Handrail shall provide a smooth and continuous gripping surface throughout the entire length of the ramp.
  - 1. A minimum clearance of 1 1/2 inches shall be maintained between the handrail and any obstructions above or behind the handrail.
  - 2. End returns are to be supplied at all landings extending 12 inches past the end of the ramp.
  - 3. A minimum of 36 inches shall be maintained between handrails to provide clear access for users.
  - 4. Handrail system shall consist of one top rail 34 inches to 38 inches above the operating surface with an intermediate railing positioned mid way between the top rail and operating surface.
  - 5. The slope of the handrail and ramp are not to exceed a 1 inch rise over a 12 inch run.

#### **1.05 SUBMITTALS.**

##### **A. Product Data.**

- 1. Supply all related technical data on the handrail system including: catalogs, material compliance sheets and material safety data sheets.

##### **B. Product Testing.**

- 1. Manufacturers, other than specified, must submit complete results of product tests or structural calculations which show that their product meets all performance requirements outlined in this specification. All test results or calculations must be certified by a Professional Engineer.

##### **C. Samples.**

- 1. Supply a railing sample complete with top and mid-rails, multiple posts, as well as base mounting system, if required by project drawings.

##### **D. Shop Drawings.**

- 1. Prior to fabrication of the handrail, shop drawings shall be submitted which include the following: plans showing location of handrail required for the project with all necessary dimensions, and detail drawings which show standard handrail elevations, typical railing connections, anchoring systems and expansion joints.

#### **2.0 PRODUCTS.**

##### **2.01 Manufacturer.**

- A. Hollaender Manufacturing Company  
Cincinnati, Ohio  
(800)772-8800
- B. Thompson Fabricating, LLC  
Tarrant, Alabama  
(800)824-6182
- C. Hansen Architectural Systems  
Hillsboro, Oregon  
(800)599-2965

- D. Or other approved equal

## **2.02 Components.**

The system will be an aluminum component (non-welded) system.

### **A. Rails and Posts.**

1. Fabricated from extruded Aluminum Pipe ASTM B429 Aluminum alloy 6063-T6; finish AA M10C22A41. Color shall be Duradonic Bronze to match other existing courthouse grounds handrail color.
2. Outside diameter 1.90 inches nominal and wall thickness 0.145 inches, Schedule 40.

### **B. Mechanical Connectors and Fasteners.**

1. The bracket shall be externally connected to the post by means of an anodized aluminum, tubular rive nut, and an austenitic 302 alloy stainless steel, hexagon socket, button head, cap screw. The bracket shall be connected to the underside of the rail by means of two stainless steel, flat countersunk head, Type F self-tapping screws that conform to ANSI/ASME-B18.6.4. Pipe fittings shall be internally connected to the pipe by means of an internal double tang, expanded by an austenitic 302 alloy stainless steel, internal/external, reverse knurl, cup point, hexagon socket set screw. Pop rivets, sheet metal screws, and adhesives shall not be an acceptable fastening method. The brackets and fittings shall be of high-tensile aluminum-magnesium alloy 535.0 manufactured in compliance with ASTM B26, cast from high-purity ingot 535.2 conforming to ASTM B179.

## **3.0 EXECUTION.**

### **3.01 Fabrication.**

- A. Handrail components shall be supplied based on site dimensions supplied by the contractor.
- B. All handrail sections shall be straight and true with no visible gaps in connections.
- C. If core mounted posts shall be supplied, the proper length for 6 inch embedment with 1/4 inch diameter weep hole located 1/4 inch above the walking surface and coated with 6 inches of bituminous mastic.

### **3.02 Installation.**

- A. Handrails shall be installed in strict accordance with the manufacturer's instructions.
- B. Once installed, all handrails shall be in compliance with the requirements of the aforementioned building codes.

### **3.03 Cleaning.**

- A. Remove all stains, dirt, grease, or other substances by washing all railings thoroughly using clean water and soap, rinse with clean water.
- B. Do not use acid solutions, steel wool, and other harsh abrasives.

C. Remove any material which is permanently stained as well as damaged.

**3.04 Method of Measurement.**

A. There shall be no additional measurement. Total quantity shall be that as shown on plans.

**3.05 Basis of Payment.**

A. The payment for this item shall be included in the bid price for Courthouse Pedestrian Ramp (Complete).