05520 METAL HANDRAILS AND RAILINGS

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SPECIFIER: This section replaces
CSI MasterFormat 2004 number 05520:
An optional keynote to the Drawings follows major product titles, for A/Es using National CAD Standard.
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PART 1 GENERAL

1.1 SUMMARY

A. Properly identified manufacturer's literature, including shop and erection drawings before starting work.

B. Railing Assemblies or Railing Components: Submit shop drawings prepared under direction of an engineer licensed in the State of Florida showing compliance to the Florida Building Code (FBC).

PART 2 PRODUCTS

2.1 HANDRAIL AND RAILING COMPONENTS

A. Wall Brackets: Malleable iron or aluminum as manufactured by Julius Blum & Company, Inc., Carlstadt, NJ, or accepted equivalent.
   1. Material:
      a. Type A: Aluminum, Model #384 for use with aluminum pipe handrail section.
      b. Type B: Malleable iron, Model #382 for use with steel pipe handrail section.

B. Pipe Handrail Sections:
   1. Stair Handrails:
      a. Size:
         1) Childrail (Lower handrail in facilities housing pre-k through grade six at 26 inches high): 1-1/4" maximum outside diameter.
         2) Handrail (Typical handrail at 34 to 38 inches): 1-1/4" to 1-1/2" outside diameter.
      b. Steel: Schedule 80, of design and dimensions indicated with smooth bends and welded joints ground smooth and flush.
      c. Aluminum:
         1) Schedule 80, Alloy 6061-T6 of design and dimensions indicated with smooth bends and welded joints ground smooth and flush.
         2) Schedule 40, Alloy 6061-T6 of design and dimensions indicated with smooth bends and joints using bolted or fastener connections of tamper-resistant fasteners.
   2. Vertical Members (Posts):
      a. Steel: (for heights 36” to 38”) 1-1/2" nominal pipe size, Schedule 40 (O.D. 1.9”), of design and dimensions indicated with welded joints ground smooth and flush.
      b. Steel: (for heights 38” to 42”) 1-1/2" nominal pipe size, Schedule 80, (O.D. 1.9”), of design and dimensions indicated with welded joints ground smooth and flush.

c. Aluminum:
1) 1-1/4" nominal pipe size, Schedule 80, Alloy 6061-T6 of design and dimensions indicated with welded joints ground smooth and flush.
2) Alternate 1-1/4" nominal pipe size, Schedule 40 alloy 6061-T6 of design and dimensions indicated with smooth bends and joints using bolted or fastener connections of tamper-resistant fasteners.

3. Design and construct to withstand 200-pound concentrated load applied at any point, from any direction.
a. Wall brackets and other points of support are shown to indicate general appearance. Submit shop drawings to indicate accurate location of necessary brackets and other points of support to show compliance with load requirements.
4. Provide complete with necessary sleeves, brackets, tamper-resistant bolts, and tamper-resistant fastening devices as required for a complete installation.

2.2 HANDRAIL AND RAILING ASSEMBLIES

A. Manufacturers:
1. Aluminum Manufacturing Industries, Inc., Miami, FL.
2. Dixie Metal Products, Inc., Ft. Lauderdale, FL.
3. Largo Aluminum, Key Largo, FL.

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Note to Specifier: The following paragraph is based on Aluminum Manufacturing Industries, Inc., 800 Series aluminum railing assembly and is to establish the required minimum criteria.

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B. Assemblies: 800 Series aluminum railing assembly, or accepted equivalent, composed of both solid castings and aluminum extrusions or shapes designed with integrally extruded locking grooves, fastener seams, and other appendages to insure a rigidly constructed assembly. Railings shall be able to withstand a 200-pound concentrated load applied to any point from any direction and a 50-pound per lineal foot load applied from any direction.

C. Fabrication:
1. Intermediate Posts:
a. Size: Square shaped, composed of two extrusions joined to form a square shape of not less than 2" x 2", designed to be mechanically fastened to the top rail channel with approved fasteners using not less than 2 extruded fastener seams.
b. Material: Alloy 6061-T6.
c. Minimum Wall Thickness: 0.062".
d. Maximum Spacing: 48 inches on center.
2. Corner Posts: Same as intermediate posts except mechanically attached to top rail using a specially designed aluminum casting.
3. Pickets:
a. Size: Square shaped, 3/4" x 3/4" mechanically fastened to the top rail channel with approved tamper-resistant fasteners using 2 extruded fastener seams to prevent picket rotation within the top and bottom extrusions.
b. Material: Alloy 6061-T5.
c. Minimum Wall Thickness: 0.062".
d. Spacing: Equal spacing placed to reject a 4-inch diameter ball.
4. Guardrails:

a. Size: Oval shaped, 2-5/8" x 1" mechanically fastened to top rail channel with approved tamper-resistant fasteners at maximum 24 inches on center.
b. Material: Alloy 6063-T6.
c. Minimum Wall Thickness: 0.062".

5. Top Rail Channel:
   a. Size: Rectangular shaped, 2" x 0.438".
   b. Material: Alloy 6063-T6.
   c. Minimum Wall Thickness: 0.062".
6. Bottom Rail:
   a. Size: Rectangular shaped, 1.625" x 1" mechanically fastened to the post with approved fasteners using 2 extruded fastener seams.
   b. Material: Alloy 6063-T6.
   c. Minimum Wall Thickness: 0.062".
7. Approved Tamper-Resistant Fasteners: 18-8 stainless steel screws with the head to be tamper-resistant, sized as recommended by the aluminum railing assembly manufacturer.

2.3 FINISHING

A. Aluminum Handrail and Railing Components and Assemblies:
   1. Finish with clear anodizing according to Aluminum Association Standard AA-C22-A21.
      a. Anodizing: 200R1 clear with a typical coating of 0.15 mil thickness produced in a 15 percent solution of H2SO4 at approximately 70 degrees F at 12 amps per sq.ft.

B. Malleable Iron Handrail and Railing Components: Finish with paint materials selected from the M-DCPS and Florida Department of Education Paint and Related Materials (M-DCPS/DOE Paints), latest edition referenced in Section 09900.

2.4 MISCELLANEOUS

A. Hot Dip Galvanizing: Hot dip galvanize ferrous items according to ASTM A385 and ASTM A123, minimum 2.0 ounces per square foot.

B. Galvanized Metal Repair Compound:
   1. Hot Applied: Federal Specifications O-G-93.
   2. Cold Applied: Galvaneal, Galvicon, or Z.R.C.

C. Isolation Coating: Zinc chromate paint, heavy-bodied bituminous paint, water-white methacrylate lacquer, or acceptable non-conductive tape.

D. Expanding Grout: Premix Anchoring Cement by Premix-Marbletite, Miami, FL, or accepted equivalent.

2.5 FASTENINGS, ANCHORS, AND BOLTS

A. Provide required cast-in-place or self-drilling anchor bolts as indicated or as recommended by the handrail and railing assembly manufacturer, complete with matching washers and nuts.

PART 3 EXECUTION

3.1 INSPECTION

A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.2 INSTALLATION

A. Erection:
   1. Erect metal handrail and railing components and metal handrail and railing assemblies at proper locations and elevations as indicated, plumb, level, in alignment, and not distorted by fastenings.
   2. Erect according to accepted shop drawings and manufacturer's directions or as specified in this section.

B. Supplementary Parts: Provide as necessary to complete each item.

C. Contact With Dissimilar Materials:
   1. Apply isolation coatings where dissimilar metals are in contact or aluminum components contact dissimilar metals or concrete or lime mortar surfaces.
   2. Select coatings appropriate to the condition from materials specified in this section.

D. Expanding Grout: Apply according to manufacturer's printed instructions to clean and dust free surfaces to ensure proper mechanical bond.

E. Malleable Iron Handrail and Railing Components: Paint to match adjacent surfaces.///