SECTION 05 53 05

METAL AND PLASTIC GRATINGS

PART 1 – GENERAL

1.1 PURPOSE

A. This guideline is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. PSP is to apply the principles of this section such that the University of Texas at Arlington (UTA) may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be approved by UTA and may require justification through Life Cycle Cost (LCC) analysis and submitted to UTA for approval.

1.2 LESSONS LEARNED AND DESIGN CONSIDERATIONS

A. Paint all cuts and welds to prevent rusting.

1.3 WORK INCLUDED

A. Formed metal areaway gratings.
B. Elevator pit grates.
C. Formed plastic gratings.
D. Perimeter closure.

1.4 RELATED WORK

A. Section 05 50 00 – Metal Fabrications.

1.5 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; current edition.
B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; current edition.
C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; current edition.
D. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; current edition.
E. ASTM B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold-Finished Bar, Rod, and Wire (Metric); current edition.
F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; current edition.
G. AWS D1.1/D1.1M - Structural Welding Code - Steel; current edition.
H. NAAMM MBG 531 - Metal Bar Grating Manual; current edition.
I. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); current edition.

1.6 PERFORMANCE REQUIREMENTS

A. Steel Grate Design Live (Pedestrian) Load: Uniform load of 150 lb/sq ft minimum; concentrated load of 300 lbs.
B. Fiberglass Grate Design Live Load: Uniform load of 250 lbs/sq ft or a concentrated load of 400 pounds, whichever produces the greater stress.
C. Maximum Allowable Deflection Under Live Load: 1/240 of span; size components by single support design.
D. Maximum Spacing Between Bars: 1/2 inch

1.7 SUBMITTALS

A. See Division 01 for submittal procedures.
B. Product Data: Provide span and deflection tables.
C. Shop Drawings: Indicate details of component supports, openings, perimeter construction details, and tolerances.
D. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
E. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.
F. Manufacturer's Installation Instructions: Indicate special requirements for opening and perimeter framing.

1.8 QUALITY ASSURANCE

A. Designer Qualifications: Design gratings and plates under direct supervision of a Professional Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Metal Bar Grating:
   1. Basis of Design: McNichols Co., Product GW Series.
   2. Other Acceptable Manufacturers:
      a). Alabama Metal Industries Corp.
      b). Barnett/Bates Corp.
   3. Substitutions: See Division 01.

B. Glass-Fiber-Reinforced Plastic Grating:
   1. Creative Pultrusions, Inc.
   2. Enduro Systems, Inc.; Composite Products Division.
   3. Fibergrate Composite Structures, Inc

C. Substitutions: See Division 01.

2.2 MATERIALS

A. Steel For Welding or Riveting: ASTM A36/A36M, unfinished, of shapes indicated.
B. Steel Framing: ASTM A36/A36M shapes, galvanized per ASTM A123/A123M.
C. Cross Bars: ASTM B211 (ASTM B211M) solid bars.
D. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.
F. Glass-Fiber-Reinforced Plastic: Glass fiber strands saturated with thermosetting polyester plastic resin.
   1. Flame Spread: 25 or less, ASTM E84.
   2. Color: Yellow.
   3. Surface: Abrasive.

2.3 ACCESSORIES

A. Fasteners and Saddle Clips: Stainless steel:
B. Perimeter Closure: Of same material as grating.

2.4 FABRICATION

A. Grating Type: NAAMM MBG 531, Pressure Locked Type.
B. Pressure-lock joints of intersecting metal sections.
C. Fabricate support framing for openings.
D. Load band cutouts if more than one bearing bar is cut.
E. Provide 4 inch toe plate at open edges of walking surfaces.
F. Fabricate support framing for openings.
G. Top Surface: Non-slip at walking surfaces.

2.5 FINISHES

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
B. Do not prime surfaces in direct contact with concrete or where field welding is required.
C. Galvanizing for Steel Shapes: ASTM A123/A123M.
D. Galvanizing for Steel Hardware: ASTM A153/A153M.
E. Non-Slip Surfacing: Aluminum oxide.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install components in accordance with manufacturer's instructions.
B. Place frames in correct position, plumb and level.
C. Mechanically cut galvanized finish surfaces. Do not flame cut.

D. Anchor by bolting through saddle clips.
E. Set perimeter closure flush with top of grating and surrounding construction.
F. Secure to prevent movement.

3.2 TOLERANCES

A. Conform to NAAMM MBG 531.

END OF SECTION