

## SECTION 05501 – IN-PLANT GUARDING SYSTEMS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. This section includes the following:
  - 1. Handrail System
    - a) Knuckle fitting handrail system

#### 1.2 SUBMITTALS

- A. Product Data for products used in Guardrail, bumper post, or handrail fabrication or installation including anchor bolts, concrete and grout.
- B. Shop drawings showing fabrication and illustrating erection of bumper post, handrail or guardrail. Include plans, elevations, sections and details showing component connections and anchorage. Provide templates for anchors installed under other sections.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURER

- A. IDEAL SHIELD  
2525 Clark Street  
Detroit, Michigan. 48209-1355  
Phone # 800-731-1722

## 2.2 HANDRAIL SYSTEM

A. Structural Performance of Handrails and Railings: Provide handrails and railings capable of withstanding the following structural loads based on 2000 international building code, without exceeding allowable design working stresses of materials for handrails, railings anchors, and connections:

1. Top Rail of Guards and hand rails: Capable of withstanding the following loads as indicated:
  - a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.
  - b. Uniform load of 50 lbf/ft: (730 N/m) applied in any direction at the top and to transfer this load through the supports to the structure.
  - c. Concentrated and uniform loads above need not be assumed to act concurrently.
2. Intermediate rails, balusters and filler panels: Capable of withstanding the following loads applied as indicated:
  - a. Applied normal load of 50 pounds (0.22kn) on an area not to exceed 1 square foot including openings and space between rails.
  - b. Reactions due to this loading are not required to be superimposed with the proceeding section.

B. Provide handrail system complying with the following requirements:

1. Slip on fitting system with exposed knuckle connectors.
  - a. Rails and Posts
    - 1) Steel Pipe Post – 1 ¼ inch IPS Schedule 80, Rails – 1 ¼ inch IPS Schedule 40 with high-density polyethylene thermoplastic coating, nominally 0.125 inch thick.
    - 2) Extruded Aluminum Pipe ASTM B429, Aluminum alloy 6061-T6., Finish AA M10C22A41. Posts – 1 ½ inch IPS Schedule 80, Rails – 1 ½ inch IPS Schedule 40.
  - b. Mechanical Connectors
    - 1) Post and handrail connector fittings
    - 2) Sand-cast of aluminum alloy 535 (ASTM B26)
    - 3) Anodize finish 0.7 mil minimum thickness.
    - 4) Design – Fittings shall be the type, which fastens to the exterior of the pipe by means of a stainless steel internal/external knurl cup point set screw (ASTM F880)
    - 5) No other fasteners will be accepted.

c. Flanges

- 1) Sand cast from aluminum alloy 535 (ASTM B26) or 3/8" Steel Design
- 2) Supplied with anodize finish. 7mil minimum thickness.
- 3) Design - Fittings shall be the type, which fastens to the exterior of the pipe by means of a stainless steel internal/external knurl cup point set screw (ASTM F880).

All anchoring hardware shall be 300 series stainless steel.

d. Fasteners

- 1) All fasteners to be 302 or 304 stainless steel
- 2) No pop rivets of sheet metal screws will be accepted

C. Infill Material

1. Intermediate Rail: {steel 1 ¼ inch scheduled 40 with polyethylene thermoplastic} {aluminum 1 ½ scheduled 40}
2. Wire cloth – {specify type of material, gauge of wire, size of mesh opening}
3. Wire mesh, welded – {specify type of material, gauge of wire, size of mesh opening}
4. Perforated polymer – {specify type of material, thickness, perforation size and shape, arrangement of perforations}
5. Pickets – {7/16" OD solid rod with 0.625 polyethylene thermoplastic} {1/2" OD aluminum anodized tube}
6. Custom

D. Finish

1. Polyethylene thermoplastic: {OSHA yellow} {as selected by Architect/Engineer from 27 earth tone colors}
2. Aluminum: {anodized} {powder coating} {custom}

## PART 3 EXECUTION

### 3.1 INSTALLATION

A. Installation Options

1. Core
2. Base Mount

END OF SECTION