

SECTION 07 72 00

PERMANENT NON-PENETRATING GUARDRAIL SYSTEM

PART 1 - GENERAL

1.1 SUMMARY AND RELATED SECTIONS

Provide and install freestanding Roof Edge Protection System, including pipe railings, uprights, bases, counterweights, fittings and delivery to site. Basis of Design: KeeGuard Permanent, Non-Penetrating Guardrail System with Infill Panels, or approved equal.

- A. Section 05 50 00 - Metal Fabrications: Associated metal supports.

1.2 REFERENCES

- A. American National Standards Institute (ANSI) - A21.1 Safety Requirements for Floor and Wall Openings, Railings and Toe Boards.
- B. American National Standards Institute (ANSI) - A58.1 Minimum Design Loads in Buildings and Other Structures.
- C. American National Standards Institute (ANSI) - A117.1 Accessible and Usable Buildings and Facilities.
- D. American Society of Testing and Materials (ASTM) A47 - Standard Specification for Ferrite Malleable Iron Castings.
- E. American Society of Testing and Materials (ASTM) A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- F. American Society of Testing and Materials (ASTM) A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- G. American Society of Testing and Materials (ASTM) A500 - Standard Specification for cold-formed welded and seamless carbon steel structural tubing.
- H. Occupational Safety & Health Administration (OSHA): 1910.23 - Guarding Floor and Wall Openings and Holes.

1.3 SUBMITTALS

- A. Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Shop Drawings: Indicate profiles, sizes, connections,

size and type of fasteners and accessories.

3. Field Measurements: Verify field measurements prior to assembly and/or ordering.

Storage and handling requirements and recommendations.

4. Installation Instruction.

- B. Shop Drawings: Drawings showing fabrication and installation of handrails and guardrails including plans, elevations, sections, details of components, anchor details, and attachment to adjoining units of work.

- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

1.4 QUALITY ASSURANCE

- A. Railings Structural Requirements:

1. Handrail, wall rail and guardrail assemblies and attachments shall withstand a minimum concentrated load of 200 pounds (90719 g) applied in any direction on the top rail.
2. Infill area of guardrail system capable of withstanding a horizontal concentrated load of 200 pounds (90719 g) applied to one square foot (8165 g/sm) at any point in the system. Load not to act concurrently with loads on top rail of system in determining stress on guardrail.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Materials to be delivered to the job site in good condition and adequately protected against damage as handrails are a finished product.
- B. Store products in manufacturer's unopened packaging until ready for installation.

1.6 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Field Measurements: Where handrails and railings are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop

drawings.

1. Where field measurements cannot be made without delaying the railing fabrication and delivery, obtain guaranteed dimensions in writing by the Contractor and proceed with fabrication of products to not delay fabrication, delivery and installation.
- C. Coordinate fabrication and delivery schedule of handrails with construction progress and sequence to avoid delay of railing installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Brand Name or Equal Manufacturer: Kee Safety, Inc.
- B. Substitutions: Follow FAR procedures prescribed by FAR 52.211-6.

2.2 SYSTEMS

- A. Provide pipe or tubing, fittings, and accessories as indicated or required to match design indicated on the Drawings.
 1. Fittings: Cast iron.
 2. Handrail Tubing, 12 gauge, Size:
 - a. 1-1/2 inches - 1.90 inches O D.
 3. Handrail Pipe, Schedule 40, Size:
 - a. 1-1/2 inches - 1.90 inches (48 mm) O D.
 4. Infill Panels:
 - a. Design as indicated. Refer to Drawings.
 - b. 1 inch, 12 gauge.
- B. Roof Edge Protection: Provide manufacturers' freestanding roof edge guard protection system, including pipe railings, uprights, bases, counterweights and fittings.
 1. Freestanding counterweighted guardrail system with 42 inch (1067 mm) minimum height to provide a pedestrian egress barrier on the roof to withstand a minimum load of 200 lb (90719 g) in any direction to the top rail per OSHA Regulation 29 CFR 1910.23.
 2. Pipe: Steel, 1-1/2 inches (48 mm) schedule 40, galvanized.
 3. Tube: Galvanized tube, 12 gauge, 1-1/2 inches, 1.90

inches (48 mm) OD.

4. Rails and Posts: Galvanized Tube, 12 gauge, 1-1/2 inches 1.90 inches (38 mm) diameter.
 5. Counterweight Levers: Galvanized Tube, 12 gauge, 1-1/4 inches 1.660 inches (38 mm) diameter.
 6. Mounting Bases: Steel bases are galvanized and are supplied with a rubber pad on underside of the component.
 7. Counterweights: Molded recycled PVC with one fixing collar per counterbalance.
 8. Fasteners: stainless steel or galvanized.
- C. Custom Design: Provide pipe, fittings, and accessories as indicated or required by Drawings to match design indicated.

2.3 MATERIALS

- A. Pipe:
1. Steel Pipe: Steel, 1-1/2 inches (38 mm) schedule 40, galvanized.
 2. Tube: Galvanized tube, 12 gauge, 1-1/2 inches, 1.90 inches (48 mm) OD.
- B. Fittings, Including Elbows, Crossovers, Wall flanges, Tees, Couplings:
1. Galvanized Malleable Cast Iron: manufacturer's clamp structural pipe fittings, ASTM A447 with ASTM A153 galvanizing.
- C. Finish: Polyester factory applied spray coating.
- D. Fasteners: Type 304 or 305 stainless steel or galvanized.

2.4 FABRICATION

- A. Fit and shop assemble components in largest practical sizes for delivery to site.
- B. Upright tops shall be plugged with weather and light resistant material.
- C. Assemble components with joints tightly fitted and secured. Accurately form components to suit installation.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

- B. Fit exposed connections accurately together to form tight joints. For all connections with manufacturer's clamp fittings, each set screw is to be tightened to 29-foot pounds (39 N-m) of torque.
- C. Perform cutting, and fitting required for installation of handrails. Set handrails and accurately in location, alignment, and elevation, measured from established lines and levels.

3.3 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

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