



## SECTION 05520

### STRUCTURE MOUNT RAILING SYSTEM

**Peak Fall Protection specializes in the design, engineering, fabrication, installation, and certification of fall protection safety systems. Our team of safety professionals can provide assistance with your facility starting with a hazard analysis site assessment to determine the most effective solution for your specific application. Peak Fall Protection's in-house installation and fabrication teams provide a certified installation and system training for your employees. The entire process is managed by our engineering team and documentation is provided as required by applicable OSHA/ANSI standards.**

**Peak Fall Protection also provides complimentary design assistance to architects or general contractors that require permanent safety systems and rooftop fall protection. Our team understands the importance of scheduling demands for new construction applications and has been providing unparalleled customer service since 2004. Allow us to serve you as a turnkey fall protection provider on your next project.**

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Permanent, structure mounted guardrail system for:
  - 1. Roof Railings
  - 2. Industrial Safety
  - 3. Loading Dock Safety
  - 4. Construction Safety
  - 5. Public Safety
  - 6. Skylight Safety
  - 7. Roof Hatches
  - 8. Crowd Control

##### 1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete.
- B. Section 05120 - Structural Steel.
- C. Section 05500 - Metal Fabrications.
- D. Section 07500 - Membrane Roofing.
- E. Section 07700 - Roof Specialties and Accessories.

##### 1.3 REFERENCES

- A. Occupational Safety and Health Administration (OSHA)
  - 1. OSHA CFR 1926.500-503 – Fall Protection
  - 2. OSHA 29 CFR 1910.23 – Walking-Working Surfaces
- B. American Institute of Steel Construction (AISC): Load and Resistance Factor Design.
- C. ASTM International:

1. ASTM A 36 - Standard Specification for Carbon Structural Steel.
  2. ASTM A 53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  3. ASTM A 153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- D. American Welding Society: AWS D1.1 - Structural Welding Code.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
  2. Storage and handling requirements and recommendations.
  3. Product literature, material specifications.
  4. Installation details and methods
  5. Dimensions of product components.
- C. Shop Drawings: Shall be to scale and show complete dimensioned railing layout, including:
1. Member sizes and part identification.
  2. Fasteners.
  3. Anchors.
  4. Fittings.
  5. Evidence of compliance with structural performance requirements, certified and sealed by a registered and licensed professional engineer.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
1. Provide products for a manufacturer that specializes in the design, fabrication, and installation of permanent railing systems with a minimum of ten years of documented experience. Companies such as miscellaneous steel fabricators that do not normal design and fabricate fall permanent railing components are not acceptable.
  2. Manufacturer shall carry specific liability insurance (products and completed operations) in an amount not less than \$5,000,000 to protect against product failure.
  3. Manufacturer shall provide samples of product for inspection or outside agency testing at the request of the owner. Manufacturer shall be compensated for additional product.
- B. Installer Qualifications:
1. Installation contractor shall be trained or qualified by manufacturer.
  2. The fall protection install contractor shall maintain appropriate insurances as applicable for the installation of fall protection systems. Installer shall have specific liability insurance (products and completed operations) in an amount not less than \$5,000,000. Proof of these insurance listings shall be supplied with the submittals listed in herein.
  3. Welding methods shall comply with AWS D1.1 and welding personnel shall be certified in accordance with AWS requirements.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards.

- B. Inspect products prior to installation and replace damage products.
- C. Store products indoors in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Protect from damage, including such that can lead to corrosion.

## 1.7 SEQUENCING AND COORDINATION

- A. Coordinate installation of products that connect to the work of other trades. Furnish setting drawings and directions for installing products that are to be embedded in concrete or masonry. Deliver such items to the project site in time for installation.
- B. General Contractor shall be immediately made aware of any site conditions that may interfere with proper installation and intended use of the permanent railing system.

## 1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install systems under environmental conditions outside manufacturer's recommended limits.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Peak Fall Protection, which is located at: 1230 Perry Rd.; Apex, NC 27502; Toll Free Tel: 866-387-9965; Fax: 919-387-9914; Email: [info@peak-fp.com](mailto:info@peak-fp.com); Web: [www.peak-fp.com](http://www.peak-fp.com)
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

### 2.2 DESIGN REQUIREMENTS

- A. Structural Performance: Comply with requirements of applicable local, state, and federal OSHA regulatory requirements.
- B. Structural performance of top rails and supports:
  - 1. Capable of withstanding a concentrated load of 200 pounds (90.6 kg), applied to the top rail at any point and in any direction.
  - 2. Capable of withstanding a uniform load of 50 pounds per linear foot (74.3 kg/m) applied to the top rail horizontally with a simultaneous load of 100 pounds per linear foot (148.6 kg/m) applied vertically downward.
  - 3. Design need not provide for both concentrated and uniform loads to be applied concurrently.
- C. Structural performance of railing infill:
  - 1. Capable of withstanding a horizontal concentrated load of 200 pounds (90.6 kg), applied to one foot (30.5mm) square area at any point on the infill.
  - 2. Infill includes panels, intermediate rails, posts and other elements.
  - 3. Design need not provide for infill loads to be applied concurrently with top rail loading.

### 2.3 MATERIALS

- A. Railing Sections.
  - 1. Size: 1-1/4 inch Schedule 40 pipe (1.66 O.D.).

2. Size: 1-1/2 inch Schedule 40 pipe (1.90 O.D.).
  3. Material: steel pipe (ASTM A53)
  4. Material: stainless steel pipe (TYPE 304)
  5. Material: aluminum pipe (6061-T6)
  6. Length: section spacing as determined by P.E.
  7. Top Rail Height: 42 inches (1067 mm) above walking/working surface.
  8. Mid Rail Height: install at 21 inches (533 mm) below top rail.
  9. Finish: Hot dipped galvanized.
  10. Finish: Epoxy powder coated safety yellow (or specify other color).
- B. Vertical Posts.
1. Size: 1-1/4 inch Schedule 40 pipe (1.66 O.D.).
  2. Size: 1-1/2 inch Schedule 40 pipe (1.90 O.D.).
  3. Size: 1-1/4 inch Schedule 80 pipe (1.66 O.D.).
  4. Size: 1-1/2 inch Schedule 80 pipe (1.90 O.D.).
  5. Material: steel pipe (ASTM A53)
  6. Material: stainless steel pipe (TYPE 304)
  7. Material: aluminum pipe (6061-T6)
  8. Location: post spacing as determined by P.E.
  9. Finish: Hot dipped galvanized.
  10. Finish: Epoxy powder coated safety yellow (or specify other color).
- C. Base Plates.
1. Size: as determined by P.E. to meet load requirements and substrate conditions
  2. Material: steel (ASTM A36)
  3. Material: stainless steel (TYPE 304)
  4. Material: aluminum (6061-T6)
  5. Fasteners: holes pre-drilled to accept appropriate fastener as determined by P.E. to meet load requirements.
  6. Finish: Hot dipped galvanized.
  7. Finish: Epoxy powder coated safety yellow (or specify other color).
- D. Gate System.
1. Length: variable – as determined by opening size between guardrail vertical posts
  2. Material: steel (ASTM A36)
  3. Material: stainless steel (TYPE 304)
  4. Material: aluminum (6061-T6)
  5. Height: 42 inches (1067 mm).
  6. Mid-rail: pre-fabricate at 21 inches (533 mm) below top rail.
  7. Finish: Hot dipped galvanized.
  8. Finish: Epoxy powder coated safety yellow (or specify other color).
  9. Closing mechanism: self-closing swing gate attached to vertical posts
- E. Fittings.
1. Material: galvanized steel
  2. Material: stainless steel
  3. Material: cast aluminum
  4. Size: 1-1/4 inch (1.66 I.D.) or to match guardrail pipe size.
  5. Size: 1-1/2 inch (1.90 I.D.) or to match guardrail pipe size
  6. Set screw: appropriate size installed by manufacturer to fitting
  7. Finish: Hot dipped galvanized.
  8. Finish: Epoxy powder coated safety yellow (or specify other color).
- F. Toeboards

1. Minimum 4" high and set ¼" above the walking/working surface.
2. To be provided at locations as indicated on drawings

## 2.4 FABRICATION

- A. Verify field conditions and dimensions prior to fabrication
- B. Use only materials that are smooth and free of blemishes for items that will be exposed to view.
- C. Design system with appropriate anchorage integration, including providing holes of the appropriate size and location on base plates.
- D. Design railings and anchorage system in accordance with all applicable local, state and federal OSHA regulatory requirements.
- E. Fit exposed ends of rail with either a D-return or pipe caps to eliminate open rail pipes.

## PART 3 EXECUTION

### 3.1 EXAMINATION AND PREPARATION

- A. Inspect and prepare substrates for compliance with anchorage requirements using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions.
- B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances and conditions that will be detrimental to the anchorage system are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

### 3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions and approved shop drawings.
- B. Before installation, inspect all parts to insure no damaged parts are used.
- C. Ensure railing is aligned and level. Ensured posts are installed plumb with tolerance of 1/8 inch. Make adjustments to ensure continuity of railings heights as derived from OSHA requirements.
- D. Spray any scratched or damaged material with appropriate touch up compound, such as cold-galvanizing spray for galvanized pipe.

### 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