



SECTION 05 52 00
HANDRAILS AND RAILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Modular aluminum railings for roof edge fall protection for wall mounted applications.
 - 1. Internal wall mount applications. (Kattsafe GR31)
 - 2. External wall mount applications. (Kattsafe GR33)
- B. Modular aluminum railings for top mount fall protection for membrane roofing. (Kattsafe GR36)
- C. Modular aluminum railings for roof edge fall protection for metal roofing. (Kattsafe GR32)
- D. Free-standing, non-penetrating modular aluminum railings for roof edge fall protection for membrane roofing. (Kattsafe GR34) (Kattsafe GR37)
- E. Free-standing, non-penetrating permanent warning line system for metal roofing. (Kattsafe WL31)
- F. Free-standing, non-penetrating permanent warning line system for membrane roofing. (Kattsafe WL32)
- G. Roof hatch guardrails. (Kattsafe)

1.2 RELATED SECTIONS

- A. Section 05 50 00 - Metal Fabrications.
- B. Section 07 41 13 - Metal Roof Panels.
- C. Section 07 50 00 - Membrane Roofing.

1.3 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI/ASSP A1264.1 - Safety Requirements for Workplace Walking/Working Surfaces and Their Access; Workplace, Floor, Wall and Roof Openings; Stairs and Guardrail/Handrail Systems.
- B. ASTM International (ASTM):
 - 1. ASTM F593 Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

2. ASTM F606/F606M Standard Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, Direct Tension Indicators and Rivets.
- C. Occupational Safety & Health Administration (OSHA):
 1. 29 CFR 1910.29 - Fall Protection Systems and Falling Object Protection.
 2. 29 CFR 1926.502 - Fall Protection Systems Criteria and Practices.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- 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. Installation methods.
- C. Shop Drawings: Provide plan, section, elevation and perspective view drawings as necessary to depict appropriate installation procedures including location, mounting, attachment, and penetration flashing as applicable.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five years demonstrated experience in installing products of the same type and scope as specified.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation. Protect all components off the ground, away from standing water on a hard, level surface.

1.7 PROJECT CONDITIONS

- A. 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.
- B. 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 recommended limits.

1.8 WARRANTY

- A. Warranty: At project closeout, submit an executed copy of the manufacturer's five year standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Kattsafe, located at: 5199 E 500 S, Suite 100; Whitestown, IN 46075, available exclusively through Logistics Lighting with an extended warranty and National Account pricing. Contact for quotes or product questions: Sales@LogisticsLighting.com or 307-633-9696 or Toll-Free at 844-455-7283 website: www.LogisticsLighting.com

B. Substitutions: Not permitted.

2.2 MODULAR ALUMINUM RAILINGS FOR ROOF EDGE FALL PROTECTION FOR WALL MOUNTED APPLICATIONS

A. Basis of Design: Kattsafe GR31 Series by Kattsafe. Modular roof edge protection aluminum guardrail system for internal wall mount applications utilizing top-railing, mid-railing, posts, splice joins, bracing and hardware.

1. Standards compliance:
 - a. ANSI/ASSP A1264.1: Railings and Toe Boards.
 - b. Top and mid rail: OSHA standards - 29 CFR 1910.29(b).
 - c. Structural Load: OSHA 29 CFR 1910.29(b)(3) and 29 CFR 1926.502(b)(3). 200 lbs. (90.7 kg), minimum, in any direction to all components.
2. Height: 42 inches (1067 mm), minimum.
3. Railings: Distance between top rail and mid rail cannot exceed 19 inches (483 mm). Distance between mid-rail and walking surface cannot exceed 19 inches (483 mm).
 - a. Top rail: 2 inch (51 mm) O.D. high tensile aluminum tubing, mill finish, free of sharp edges and snag points.
 - b. Mid rail: 1-5/8 inch (41 mm) O.D. high tensile aluminum, mill finish tubing, free of sharp edges and snag points. Distance between top rail/mid rail and mid rail/walking surface cannot exceed 19 inches (483 mm).
4. Mounting posts: 2-1/4 x 1-1/2 x 1/8 inch thick (57 x 38 x 3 mm thick). high tensile aluminum rectangular hollow section, mill finish, free of sharp edges and snag points.
5. Splice Joins: Connecting the top and mid rails together in a continuous railing system free of sharp edges and snag points.
6. Adjustable Elbows: Accommodating angles and elevation changes.
7. Connecting Hardware: ASTM F593-13a and ASTM F606/F606M-14a. 304 stainless steel. Includes fasteners, rivets (where required) and anchors.
8. Accessories:
 - a. Toe board.
 - b. Parapet bracket for wall mount GR31 guardrail.
 - c. Self-Closing Gate.

B. Basis of Design: Kattsafe GR33 Series by Kattsafe. Modular roof edge protection aluminum guardrail system for external wall mount applications utilizing top-railing, mid-railing, posts, splice joins, bracing and hardware.

1. Standards compliance:
 - a. ANSI/ASSP A1264.1: Railings and Toe Boards.
 - b. Top and mid rail: OSHA standards - 29 CFR 1910.29(b).
 - c. Structural Load: OSHA 29 CFR 1910.29(b)(3) and 29 CFR 1926.502(b)(3). 200 lbs. (90.7 kg), minimum, in any direction to all components.
2. Height: 42 inches (1067 mm), minimum.
3. Railings: Distance between top rail and mid rail cannot exceed 19 inches (483 mm). Distance between mid-rail and walking surface cannot exceed 19 inches (483 mm).
 - a. Top rail: 2 inch (51 mm) O.D. high tensile aluminum tubing, mill finish, free of sharp edges and snag points.

- b. Mid rail: 1-5/8 inch (41 mm) O.D. high tensile aluminum, mill finish tubing, free of sharp edges and snag points. Distance between top rail/mid rail and mid rail/walking surface cannot exceed 19 inches (483 mm).
- 4. Mounting posts: 2-1/4 x 1-1/2 x 1/8 inch thick (57 x 38 x 3 mm thick). high tensile aluminum rectangular hollow section, mill finish, free of sharp edges and snag points.
- 5. Splice Joins: Connecting the top and mid rails together in a continuous railing system free of sharp edges and snag points.
- 6. Adjustable Elbows: Accommodating angles and elevation changes.
- 7. Connecting Hardware: ASTM F593-13a and ASTM F606/F606M-14a. 304 stainless steel. Includes fasteners, rivets (where required) and anchors.
- 8. Accessories:
 - a. Toe board.
 - b. Parapet bracket for wall mount GR31 guardrail.
 - c. Self-Closing Gate.

2.3 PREFABRICATED MODULAR ALUMINUM TOP MOUNT ROOF GUARDRAIL FOR MEMBRANE ROOF SYSTEMS

A. Basis of Design: Kattsafe GR36 Series Prefabricated Modular Topmount Roof Guardrail for Membrane Roof Systems as supplied by Kattsafe.

- 1. Post Kit:
 - a. Aluminum Post: Mill Finish Aluminum, 6005-T6.
 - 1) Material Thickness: 1/8 inch (3 mm).
 - 2) Dimensions: 2-1/4 x 1-1/2 x 42 inches (57 x 38 x 1067 mm).
 - b. Aluminum Channel and Brace: Mill Finish Aluminum, 6005-T6. Quantity: Two.
 - 1) Material Thickness: 1/8 inch (3 mm).
 - 2) Dimensions: 2-1/2 x 1-1/2 inch (64 x 38 mm).
 - 3) Length, 1st Brace: 18 inches (457 mm).
 - 4) Length, 2nd Brace: 15 inches (381 mm).
- 2. Guardrail:
 - a. Aluminum Top Rail: Mill Finish Aluminum, 6005-T6.
 - 1) Dimensions: 2 inches (51 mm) diameter.
 - 2) Supplied Length: 10 ft (3048 mm).
 - 3) Weight: 0.75 lbs per ft (1.12 kg per m).
 - b. Aluminum Mid Rail:
 - 1) Dimensions: 1-5/8 inches (41 mm) diameter.
 - 2) Supplied Length: 10 ft (3048 mm).
 - 3) Material: Mill Finish Aluminum, 6005-T6.
 - 4) Weight: 0.40 lbs per ft (0.59 kg per m).
- 3. Components:
 - a. Top Rail Brace: One required per corner and termination.
 - 1) Material: Mill Finish Aluminum, 6106-T6.
 - 2) Weight: 0.50 lbs (0.23 kg).
 - b. Rail Splice Joins: Die Cast Aluminum.
 - 1) Length: 9.5 inches (241 mm).
 - 2) Weight: 0.40 lbs (0.18 kg).
 - c. Top Rail End Cap: Die Cast Aluminum.
 - 1) Weight: 0.10 lbs (0.05 kg).
 - d. Mid Rail End Cap: Die Cast Aluminum.
 - 1) Weight: 0.06 lbs (0.03 kg).
 - e. Top Rail Elbow Corner: Die Cast Aluminum.
 - 1) Weight: 0.80 lbs (0.36 kg).
 - f. Mid Rail Elbow Corner: Die Cast Aluminum.
 - 1) Weight: 0.40 lbs (0.18 kg).
 - g. Double Stud Plate. Quantity: Three.
- 4. Hardware: Stainless steel.

- a. Tek Screw: Post connection, braces, end caps and handrail mounting to brace.
 - 1) Size: No. 10 x 5/8 inch (16 mm).
 - 2) Quantity: 8 per post, 2 per brace, 1 per end cap kit, and 2 per corner kit.
- b. Tek Screw: Mounting mid rail to post.
 - 1) Size: No. 12 x 2 inches (51 mm) Long.
 - 2) Quantity: 2 per post.
- c. Mounting Post to U-Anchor:
 - 1) Flanged Nut: 3/8 inch UNC thread. Quantity: Two.
 - 2) Flat Washer: 3/8 inch (9.5 mm). Quantity: Two.
 - a) Inner Diameter: 0.406 inch (10.31 mm).
 - b) Outer Diameter: 0.680 inch (17.27 mm).
 - 3) Split Lock Washer: 3/8 inch. Quantity: Two.
 - a) Inner Diameter: 0.385 inch (9.78 mm).
 - b) Outer Diameter: 0.875 inch (22.22 mm).

2.4 MODULAR ALUMINUM RAILINGS FOR ROOF EDGE FALL PROTECTION FOR METAL ROOFING

- A. Basis of Design: Kattsafe GR32 Series by Kattsafe. Modular roof edge protection aluminum guardrail system for metal roof and standing seam roof applications utilizing top-railing, mid-railing, posts, splice joins, bracing and hardware.
 - 1. Standards compliance:
 - a. ANSI/ASSP A1264.1: Railings and Toe Boards.
 - b. Top and mid rail: OSHA standards - 29 CFR 1910.29(b).
 - c. Structural Load: OSHA 29 CFR 1910.29(b)(3) and 29 CFR 1926.502(b)(3). 200 lbs. (90.7 kg), minimum, in any direction to all components.
 - 2. Height: 42 inches (1067 mm), minimum.
 - 3. Railings: Distance between top rail and mid rail cannot exceed 19 inches (483 mm). Distance between mid-rail and walking surface cannot exceed 19 inches (483 mm).
 - a. Top rail: 2 inch (51 mm) O.D. high tensile aluminum tubing, mill finish, free of sharp edges and snag points.
 - b. Mid rail: 1-5/8 inch (41 mm) O.D. high tensile aluminum, mill finish tubing, free of sharp edges and snag points.
 - 4. Mounting posts: 2-1/4 x 1-1/2 x 1/8 inch thick (57 x 38 x 3 mm thick). high tensile aluminum rectangular hollow section, mill finish, free of sharp edges and snag points.
 - 5. Splice Joins: Connecting the top and mid rails together in a continuous railing system free of sharp edges and snag points.
 - 6. Adjustable Elbows: Accommodating angles and elevation changes.
 - 7. Connecting Hardware: ASTM F593-13a and ASTM F606/F606M-14a. 304 stainless steel. Includes fasteners, and anchors.
 - a. Rivets: 305 stainless steel.
 - b. Rivets: Aluminum; 5/16 inch (8 mm) diameter.
 - c. Non-Penetrating Clamps: Aluminum.
 - 8. Accessories:
 - a. Toe board.
 - b. Finish Rails (Closed D-loop kit for end of guardrail systems).
 - c. Self-Closing Gate.

2.5 FREE-STANDING, NON-PENETRATING MODULAR ALUMINUM RAILINGS FOR ROOF EDGE FALL PROTECTION FOR MEMBRANE ROOFING

- A. Basis of Design: Kattsafe GR34 Series by Kattsafe. Modular, free-standing, non-penetrating roof edge protection aluminum guardrail system for built-up and membrane roof applications utilizing top-railing, mid-railing, posts, weighted bases, splice joins, bracing and hardware.
 - 1. Standards compliance:
 - a. ANSI/ASSP A1264.1: Railings and Toe Boards.

- b. Top and Mid Rail: OSHA standards - 29 CFR 1910.29(b).
 - c. Structural Load: OSHA 29 CFR 1910.29(b)(3) and 29 CFR 1926.502(b)(3). 200 lbs. (90.7 kg), minimum, in any direction to all components.
 - 2. Height: 42 inches (1067 mm), minimum.
 - 3. Railings: Distance between top rail and mid rail cannot exceed 19 inches (483 mm). Distance between mid-rail and walking surface cannot exceed 19 inches (483 mm).
 - a. Top rail: 2 inch (51 mm) O.D. high tensile aluminum tubing, mill finish, free of sharp edges and snag points.
 - b. Mid rail: 1-5/8 inch (41 mm) O.D. high tensile aluminum, mill finish tubing, free of sharp edges and snag points. Distance between top rail/mid rail and mid rail/walking surface cannot exceed 19 inches
 - 4. Mounting posts: 2-1/4 x 1-1/2 x 1/8 inch thick (57 x 38 x 3 mm thick). high tensile aluminum rectangular hollow section, mill finish, free of sharp edges and snag points.
 - 5. Weighted Bases (H x W x L): 5/8 x 23-1/2 x 23-1/2 inches (16 x 597 x 597 mm) plastic coated steel.
 - a. Pre-tapped holes for post mounting.
 - b. Membrane protection under base.
 - 6. Splice Joins: Connecting the top and mid rails together in a continuous railing system free of sharp edges and snag points.
 - 7. Adjustable Elbows: Accommodating angles and elevation changes.
 - 8. Connecting Hardware: ASTM F593-13a and ASTM F606/F606M-14a. 304 stainless steel. Includes fasteners, rivets (where required) and anchors.
 - 9. Accessories:
 - a. Toe board.
 - b. Self-Closing Gate.
- B. Basis of Design: Kattsafe GR37 Series by Kattsafe. Modular, free-standing, non-penetrating roof edge protection aluminum guardrail system for built-up and membrane roof applications. Its stackable base design supports endless configurations, offering flexibility and ease of use.
- 1. Compliance: Meets or exceeds OSHA, CAL-OSHA, and ANSI regulations as applicable.
 - 2. Performance and Design Requirements:
 - a. Not to be installed on roof slopes 1:12 or greater.
 - b. Top Rail Loading: Meet or exceed 200 lbs load in any direction in accordance with OSHA Regulation 29, CFR 1926.502 and 1910.29
 - c. Railing Height: 42 inches.
 - d. Distance Between Top and Mid Rail: 19 inch maximum.
 - e. Post Spacing: 8 ft maximum.
 - f. Bases: Positioned not less than 2 ft from roof edge where there is no parapet or small wall.
 - g. Supplied to jobsite in Kit form.
 - h. Warranty: 5 year from date of installation, subject to correct installation, use, and maintenance in accordance with manufacturer's specifications and recommendations.
 - 1) Exception: Weighted bases have a 2 year warranty.
 - i. Set-Up: Ballasted or cantilevered.
 - j. Component Assembly: T-bolt design.
 - k. Components:
 - 1) Weighted bases. Polymer coated concrete.
 - 2) Intermediate counterweight base.
 - 3) End post.
 - 4) Base foot.
 - 5) T-bolt.
 - 6) End Kits: Required at the start and stop of any GR37 free-standing guardrail system regardless of length.

- 7) Brace: For each corner between posts and ends of top rails.
- 8) Splice Kits for top and mid rails.
- 9) End Caps: For exposed top and mid rail ends
- 10) Hardware: 304 Stainless steel.
- l. Configuration: Intermediate with Counterweight. GR37.INT.CW.
 - 1) Bases on counterweight set-up.
- m. Configuration: Intermediate In-Line. GR37.INT.IN.
 - 1) Bases mounted directly to posts, 2 bases.
- n. Configuration: Intermediate for any High Load Application. GR37.INT.HL.
 - 1) 20 lbs per ft, four bases.
- 3. Material and Dimensions: High strength Aluminum.
 - a. Top Rail: 2 inch (51 mm) diameter extruded 6000 series aluminum profiled tube; 0.75 lbs per ft.
 - b. Mid Rail: 1-5/8 inches extruded 6000 series aluminum profiled tube; 0.40 lbs per ft.
 - c. Splice Joins: Profiled Aluminum Tube
 - d. Post: 2-1/4 x 1-1/2 x 1/8 inch extruded 6000 series rectangular slotted tube. 2.70 lbs per ft.
 - e. Toe Board: 4-1/4 x 1 x 3/32 inches extruded 6000 series aluminum channel. 0.70 lbs per ft.
 - f. Post and Base Footing: Cast aluminum. Holds post at 10 degrees off vertical angle.
 - g. Hardware: All stainless steel.
 - h. Corner Elbows: Die cast aluminum.
 - 1) Top Rail Corner: 0.8 lbs. Mid Rail Corner: 0.42 lbs.
 - i. End Caps: Plastic.
- 4. Finish of Aluminum Sections: Mill finish.
- 5. Finish of Aluminum Sections: Safety yellow powder coat.

2.6 FREE-STANDING NON-PENETRATING PERMANENT WARNING LINE SYSTEM FOR METAL ROOFING

- A. Basis of Design: Kattsafe WL31 by Kattsafe. Permanent modular non-penetrating warning line system for metal and standing seam roof applications utilizing posts, mounting bases, galvanized plastic coated cable, warning flags, and hardware.
 - 1. Standards compliance: OSHA Code 1926.502(f)(2)(iii); erected not less than 6 feet (1.8 m) from the roof edge. Resists, without tipping over, a force of at least 16 pounds (71 N) applied horizontally against the stanchion.
 - 2. Mounting posts: 2-1/4 x 1-1/2 x 1/8 inch thick (57 x 38 x 3 mm thick). high tensile aluminum rectangular hollow section, mill finish, free of sharp edges and snag points. Post height: 39 inches (991 mm). Mounts to metal roof mounting base with stainless steel hardware.
 - 3. Metal Roof Mounting Bases (H x W x L): 5/8 x 26 x 16-1/4 inches, (16 x 660 x 413 mm) aluminum 5000 series. Pre-drilled holes for post mounting.
 - 4. Cable: 3/16 inch (5 mm) galvanized aircraft cable: vinyl coated with aluminum crimped termination sleeves
 - 5. Flags: Aluminum sheet with 'Warning' stamp. Powder coated safety yellow.
 - 6. Flag location: Located every 6 feet (1.83 m) with aluminum sleeve to maintain 6 feet (1.83 m) spacing
 - 7. Connecting Hardware: ASTM F593-13a and ASTM F606/F606M-14a. 304 stainless steel. Includes fasteners, and anchors.
 - a. Rivets: 305 stainless steel.
 - b. Rivets: Aluminum; 5/16 inch (8 mm) diameter.
 - c. Non-penetrating clamps: Aluminum.

2.7 FREE-STANDING NON-PENETRATING PERMANENT WARNING LINE SYSTEM FOR MEMBRANE ROOFING

- A. Basis of Design: Kattsafe WL32 by Kattsafe. Permanent, modular non-penetrating warning line system for built-up and membrane roof applications utilizing posts, weighted bases, galvanized plastic coated cable, warning signs and hardware.
1. Compliance: OSHA Code 1926.502(f)(2)(iii); erected not less than 6 feet (1.8 m) from the roof edge. Resists, without tipping over, a force of at least 16 pounds (71 N) applied horizontally against the stanchion.
 2. Mounting Posts: 2-1/4 x 1-1/2 x 1/8 inch thick (57 x 38 x 3 mm thick). high tensile aluminum rectangular hollow section, mill finish, free of sharp edges and snag points. Post height: 39 inches (991 mm). Mounts to weighted base with stainless steel hardware.
 3. Weighted Bases (H x W x L): 5/8 x 23 x 23 inches (16 x 584 x 584 mm) hot rolled galvanized steel.
 - a. Pre-tapped holes for post mounting.
 - b. Membrane protection under base.
 4. Cable: 3/16 inch (5 mm) galvanized aircraft cable: vinyl coated with aluminum crimped termination sleeves
 5. Flags: Aluminum sheet with 'Warning' stamp. Powder coated safety yellow.
 6. Flag Location: Located every 6 feet (1.83 m) with aluminum sleeve to maintain 6 feet (1.83 m) spacing

2.8 ROOF HATCH GUARDRAIL

- A. Basis of Design: Kattsafe Aluminum Roof Hatch Guardrail System by Kattsafe. A fixed railing system providing permanent fall protection for hatch openings. Available in multiple sizes, and can fit most existing hatches or installed on the Kattsafe Roof Hatch. A clamping system eliminates the need to drill holes into the hatch or roof surface, jeopardizing the roof warranty. Installs in minutes with basic tools.
1. Sizes: Standard roof hatch sizes available in stock. Can be custom made to fit irregular roof hatch sizes.
 2. Color: Safety Yellow Standard. Powder Coating Available.
 3. OSHA Compliance: 1910.28(b)(3)(i), 1910.28(b)(3)(iv)
 4. Warranty: 5 years standard (does not include moving parts); extended warranty available through Logistics Lighting.
 5. Exit Types: Front, front1, front2, left, or right.
 6. Self-closing gate.
 7. Grabrails.
 8. Handrail Tubing: 2 inch round, Aluminum 6106-T6.
 - a. No. 10 x 5/8 inch Stainless Steel Self tapping screws: Two per post.
 - b. Handrail end caps.
 9. Kneerail Tubing: 1-5/8 inch round Aluminum 6061-T6.
 - a. No. 12 x 2 inch Stainless Steel Self tapping screws: Two per post.
 10. Clamping System Frame: Kattsafe.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, approved submittals and in proper relationship with adjacent construction.

3.4 PROTECTION

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

END OF SECTION