SECTION 05 52 00

HANDRAILS AND RAILINGS

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\*\* NOTE TO SPECIFIER \*\* Kattsafe; safe access and fall protection.
This section is based on the products of Kattsafe, which is located at:
3921 Perry Blvd.
Whitestown, IN 46075
Toll Free Tel: 888-637-7872
Tel: 317-769-7710
Fax: 317-229 6451
Email: [request info (sales@kattsafe.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Kattsafe&coid=48709&rep=&fax=317-229)
Web: <https://www.kattsafe.com>
 [ [Click Here](https://www.arcat.com/arcatcos/cos48/arc48709.html) ] for additional information.
Kattsafe began trading as a family-owned business in 1975 in the United Kingdom. We started an office in the USA in 2008 and have seen rapid and positive growth since.
Our extensive range of safe access products and fall protection systems are primarily designed for rooftop applications. The roof environment is dangerous, and workers are exposed to multiple fall hazards. The rooftop is often considered as out of sight, out of mind. We aim to reverse this theory through education and simplicity. Our goal is to ensure that any worker subjected to working on roofs has maximum safety with minimum fuss.
Our Vision: To ensure those working at heights return home safely.
We back up our comprehensive product range with first class customer service. As a company, we have always gone that extra mile to ensure absolute customer satisfaction. Every member of our technical customer service team has been extensively trained, to ensure that you receive the best possible advice, care and completely up to date product information.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Modular aluminum railings for roof edge fall protection for membrane roofing.
			1. Internal wall mount applications. (Kattsafe GR31)
			2. External wall mount applications. (Kattsafe GR33)
		2. Modular aluminum railings for top mount fall protection for membrane roofing. (Kattsafe GR36)
		3. Modular aluminum railings for roof edge fall protection for metal roofing. (Kattsafe GR32)
		4. Free-standing, non-penetrating modular aluminum railings for roof edge fall protection for membrane roofing. (Kattsafe GR34)
		5. Free-standing, non-penetrating permanent warning line system for metal roofing. (Kattsafe WL31)
		6. Free-standing, non-penetrating permanent warning line system for membrane roofing. (Kattsafe WK32)
		7. Roof hatch guardrails. (Kattsafe)
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 05 50 00 - Metal Fabrications.
		2. Section 07 41 13 - Metal Roof Panels.
		3. Section 07 50 00 - Membrane Roofing.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American National Standards Institute (ANSI):
			1. ANSI A21.l - Safety Requirements for Floor and Wall Openings, Railings and Toe Boards.
		2. 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.
		3. Occupational Safety & Health Administration (OSHA):
			1. 29 CFR 1910.23 - Guarding Floor and Wall Openings and Holes.
			2. 29 CFR 1926.502 - Fall Protection Systems Criteria and Practices.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. 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.
		3. 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.
	2. QUALITY ASSURANCE
		1. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.
		2. 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.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
			1. Finish areas designated by Architect.
			2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
			3. Rebuild mock-up area as required to produce acceptable work.
	1. DELIVERY, STORAGE, AND HANDLING
		1. 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.
	2. PROJECT CONDITIONS

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. 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.
		2. 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. WARRANTY
		1. 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.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Kattsafe, which is located at: 3921 Perry Blvd.; Whitestown, IN 46075; Toll Free Tel: 888-637-7872; Tel: 317-769-7710; Fax: 317-229 6451; Email: [request info (sales@kattsafe.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Kattsafe&coid=48709&rep=&fax=317-229); Web: <https://www.kattsafe.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
	1. MODULAR ALUMINUM RAILINGS FOR ROOF EDGE FALL PROTECTION FOR MEMBRANE ROOFING

\*\*NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. 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:
				1. ANSI A21.l: Railings and Toe Boards.
				2. Top and mid rail: OSHA standards - 29 CFR 1910.23 (a)(2).
				3. Structural Load: OSHA Regulation 29 CFR 1926.502. 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).
				1. Top rail: 2 inch (51 mm) O.D. high tensile aluminum tubing, mill finish, free of sharp edges and snag points.
				2. 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:
				1. Toe board.
				2. Parapet bracket for wall mount GR31 guardrail.
				3. Self-Closing Gate.

\*\*NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. 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:
				1. ANSI A21.l: Railings and Toe Boards.
				2. Top and mid rail: OSHA standards - 29 CFR 1910.23 (a)(2).
				3. Structural Load: OSHA Regulation 29 CFR 1926.502. 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).
				1. Top rail: 2 inch (51 mm) O.D. high tensile aluminum tubing, mill finish, free of sharp edges and snag points.
				2. 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:
				1. Toe board.
				2. Parapet bracket for wall mount GR31 guardrail.
				3. Self-Closing Gate.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. PREFABRICATED MODULAR ALUMINUM TOP MOUNT ROOF GUARDRAIL FOR MEMBRANE ROOF SYSTEMS
		1. Basis of Design: Kattsafe GR36 Series Prefabricated Modular Topmount Roof Guardrail for Membrane Roof Systems as supplied by Kattsafe.
			1. Post Kit:
				1. Aluminum Post: Mill Finish Aluminum, 6005-T6.

Material Thickness: 1/8 inch (3 mm).

Dimensions: 2-1/4 x 1-1/2 x 42 inches (57 x 38 x 1067 mm).

* + - * 1. Aluminum Channel and Brace: Mill Finish Aluminum, 6005-T6. Quantity: Two.

Material Thickness: 1/8 inch (3 mm).

Dimensions: 2-1/2 x 1-1/2 inch (64 x 64 mm).

Length, 1st Brace: 18 inches (457 mm).

Length, 2nd Brace: 15 inches (381 mm).

* + - 1. Guardrail:
				1. Aluminum Top Rail: Mill Finish Aluminum, 6005-T6.

Dimensions: 2 inches (51 mm) diameter.

Supplied Length: 10 ft (3048 mm).

Weight: 0.75 lbs per ft (1.12 kg per m).

* + - * 1. Aluminum Mid Rail:

Dimensions: 1-5/8 inches (41 mm) diameter.

Supplied Length: 10 ft (3048 mm).

Material: Mill Finish Aluminum, 6005-T6.

Weight: 0.40 lbs per ft (0.59 kg per m).

* + - 1. Components:
				1. Top Rail Brace: One required per corner and termination.

Material: Mill Finish Aluminum, 6106-T6.

Weight: 0.50 lbs (0.23 kg).

* + - * 1. Rail Splice Joins: Die Cast Aluminum.

Length: 9.5 inches (241 mm).

Weight: 0.40 lbs (0.018 kg).

* + - * 1. Top Rail End Cap: Die Cast Aluminum.

Weight: 0.10 lbs (0.05 kg).

* + - * 1. Mid Rail End Cap: Die Cast Aluminum.

Weight: 0.06 lbs (0.03 kg).

* + - * 1. Top Rail Elbow Corner: Die Cast Aluminum.

Weight: 0.80 lbs (0.36 kg).

* + - * 1. Mid Rail Elbow Corner: Die Cast Aluminum.

Weight: 0.40 lbs (0.18 kg).

* + - * 1. Double Stud Plate. Quantity: Three.
			1. Hardware: Stainless steel.
				1. Tek Screw: Post connection, braces, end caps and handrail mounting to brace.

Size: No. 10 x 5/8 inch (16 mm).

Quantity: 8 per post, 2 per brace, 1 per end cap kit, and 2 per corner kit.

* + - * 1. Tek Screw: Mounting mid rail to post.

Size: No. 12 x 2 inches (51 mm) Long.

Quantity: 2 per post.

* + - * 1. Mounting Post to U-Anchor:

Flanged Nut: 3/8 inch UNC thread. Quantity: Two.

Flat Washer: 3/8 inch (9.5 mm). Quantity: Two.

Inner Diameter: 0.406 inch (10.31 mm).

Outer Diameter: 0.680 inch (17.27 mm).

Split Lock Washer: 3/8 inch. Quantity: Two.

Inner Diameter: 0.385 inch (9.78 mm).

Outer Diameter: 0.875 inch (22.22 mm).

* 1. MODULAR ALUMINUM RAILINGS FOR ROOF EDGE FALL PROTECTION FOR METAL ROOFING

\*\*NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. 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:
				1. ANSI A21.l: Railings and Toe Boards.
				2. Top and mid rail: OSHA standards - 29 CFR 1910.23 (a)(2).
				3. Structural Load: OSHA Regulation 29 CFR 1926.502. 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).
				1. Top rail: 2 inch (51 mm) O.D. high tensile aluminum tubing, mill finish, free of sharp edges and snag points.
				2. 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.

\*\*NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Rivets: 305 stainless steel.

\*\* NOTE TO SPECIFIER \*\* Aluminum rivets may be used in certain situation. Refer to product literature or contact an authorized manufacturer's representative for more information. Delete if not required.

* + - * 1. Rivets: Aluminum; 5/16 inch (8 mm) diameter.

\*\* NOTE TO SPECIFIER \*\* Applies to standing seam roofs. Delete if not required.

* + - * 1. Non-penetrating clamps: Aluminum.
			1. Accessories:
				1. Toe board.
				2. Finish Rails (Closed D-loop kit for end of guardrail systems).
				3. Self-Closing Gate.

\*\*NOTE TO SPECIFIER \*\* Delete if not required.

* 1. FREE-STANDING, NON-PENETRATING MODULAR ALUMINUM RAILINGS FOR ROOF EDGE FALL PROTECTION FOR MEMBRANE ROOFING
		1. 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:
				1. ANSI A21.l: Railings and Toe Boards.
				2. Top and mid rail: OSHA standards - 29 CFR 1910.23 (a)(2).
				3. Structural Load: OSHA Regulation 29 CFR 1926.502. 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).
				1. Top rail: 2 inch (51 mm) O.D. high tensile aluminum tubing, mill finish, free of sharp edges and snag points.
				2. 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 x 23 inches (16 x 584 x 584 mm) hot rolled galvanized steel. .
				1. Pre-tapped holes for post mounting.

\*\* NOTE TO SPECIFIER \*\* Recommended but not supplied by manufacturer. Delete if not required.

* + - * 1. Membrane protection under base.
			1. Splice Joins: Connecting the top and mid rails together in a continuous railing system free of sharp edges and snag points.
			2. Adjustable Elbows: Accommodating angles and elevation changes.
			3. Connecting Hardware: ASTM F593-13a and ASTM F606/F606M-14a. 304 stainless steel. Includes fasteners, rivets (where required) and anchors.
			4. Accessories:
				1. Toe board.
				2. Self-Closing Gate.

 2.4 \*\*NOTE TO SPECIFIER \*\* Delete if not required.

* 1. FREE-STANDING NON-PENETRATING PERMANENT WARNING LINE SYSTEM FOR METAL ROOFING
		1. 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.

\*\*NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Rivets: 305 stainless steel.

\*\* NOTE TO SPECIFIER \*\* Aluminum rivets may be used in certain situation. Refer to product literature or contact an authorized manufacturer's representative for more information. Delete if not required.

* + - * 1. Rivets: Aluminum; 5/16 inch (8 mm) diameter.

\*\* NOTE TO SPECIFIER \*\* Applies to standing seam roofs. Delete if not required.

* + - * 1. Non-penetrating clamps: Aluminum.

\*\*NOTE TO SPECIFIER \*\* Delete if not required.

* 1. FREE-STANDING NON-PENETRATING PERMANENT WARNING LINE SYSTEM FOR MEMBRANE ROOFING
		1. Basis of Design: Kattsafe WL 32 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.
				1. Pre-tapped holes for post mounting.

\*\* NOTE TO SPECIFIER \*\* Recommended but not supplied by manufacturer. Delete if not required.

* + - * 1. Membrane protection under base.
			1. Cable: 3/16 inch (5 mm) galvanized aircraft cable: vinyl coated with aluminum crimped termination sleeves
			2. Flags: Aluminum sheet with ' Warning' stamp. Powder coated safety yellow.
			3. Flag location: Located every 6 feet (1.83 m) with aluminum sleeve to maintain 6 feet (1.83 m) spacing
	1. ROOF HATCH GUARDRAIL
		1. 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: 10 years. Does not include moving parts.
			5. Exit Types: Front, front1, front2, left, or right.
			6. Roof Hatch Flange Length: \_\_\_ inch (\_\_\_ mm).
			7. Roof Hatch Flange Width: \_\_\_ inch (\_\_\_ mm).
			8. Self-closing gate.
			9. Grabrails.
			10. Handrail Tubing: 2 inch round, Aluminum 6106-T6.
				1. No. 10 x 5/8 inch Stainless Steel Self tapping screws: Two per post.
				2. Handrail end caps/
			11. Kneerail Tubing: 1-5/8 inch round Aluminum 6061-T6.
				1. No. 12 x 2 inch Stainless Steel Self tapping screws: Two per post.
			12. Clamping System Frame: Kattsafe.
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	3. INSTALLATION
		1. Install in accordance with manufacturer's instructions, approved submittals and in proper relationship with adjacent construction.
	4. PROTECTION
		1. Protect installed products until completion of project.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION