SECTION 05 52 17

METAL GUARDRAIL AND ROOFTOP FALL PROTECTION

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\*\* NOTE TO SPECIFIER \*\* Tie Down; products.
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This section is based on the products of Tie Down, which is located at:605 Stonehill Drive S.W.Atlanta, GA 30336Toll Free Tel: 800-241-1806Tel: 404-344-0000Email: [request info (sales@tiedown.com)](https://arcat.com/rfi?action=email&company=Tie%252BDown&message=RE%253A%2520Spec%2520Question%2520(05622tie)%253A%2520&coid=51441&spec=05622tie&rep=&fax=)
Web: <https://www.tiedown.com>
 [ [Click Here](https://arcat.com/company/tie-down-51441) ] for additional information.
Tie Down has always believed in growth through innovation in both product and manufacturing capabilities. In the early 80's, Tie Down became one of the first manufacturers in the Southeast to incorporate robotic welding. Early 90's brought CNC sheet laser cutting permitting the growth of products no longer dependent on the older legacy manufacturing methods that traditionally required great expense in both hard tooling and higher volume run requirements from coiled steel. CNC laser cutting also allowed much greater freedom in engineering design as the shapes and profiles being produced in CAD were no longer constrained to hard tooling. Tie Down was also an early adopter of 3D modeling as well as FEA analysis when such tools were still in their infancy.

1. GENERAL
	1. SECTION INCLUDES

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

* + 1. Tie Down Universal Guardrail Fall Protection System
		2. Tie Down Zip Rail Compression Bracket System with Container (Parapet Mount)
		3. Tie Down Zip Rail Gravel Stop System with Container
		4. Tie Down Steep Slope Guardrail
		5. Tie Down Rake Edge Bracket
		6. Tie Down Galvanized Roof Anchor
		7. Overhead Fall Arrest System
		8. Commercial Roof Anchors
	1. RELATED SECTIONS

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

* + 1. Section 07 42 00 - Wall Panels [07 42 00] - Metal Roofing.
		2. Section 07 42 43 - Composite Wall Panels [07 42 43] - Composite Roof Panels
		3. Section 07 51 13 - Built-Up Asphalt Roofing [07 51 13] - Built-Up Roofing.
		4. Section 07 53 13 - Chlorinated-Polyethylene Roofing [07 53 13] - Electrometric Roofing.
		5. Section 07 70 00 - Roof and Wall Specialties and Accessories [07 70 00] - Roof Specialties and Accessories.
	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 Welding Society: AWS D1.1 - Structural Welding Code - Steel.
		2. ANSI Z359.6 / OSHA 1926 Sub M App C
		3. Occupational Safety & Health Administration (OSHA): 29 CFR 1910.23 - Guarding Floor and Wall Openings and Holes.
		4. Occupational Safety & Health Administration (OSHA): 29 CFR 1926.501 - Duty to Have Fall Protection.
		5. Occupational Safety & Health Administration (OSHA): 29 CFR 1926.502 - Fall Protection Systems Criteria and Practices.
		6. Occupational Safety & Health Administration (OSHA): 29 CFR 1926.503 - Training Requirements.
		7. Occupational Safety & Health Administration (OSHA): 29 CFR 1910 Sub I App D CSA Z259.16
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements [01 30 00].
		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: Drawings showing plans, elevations, sections and details of components. Show member sizes and part identification, fasteners, anchors, fittings and evidence of compliance with structural performance requirements.
		4. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns
		5. Manufacturer's Certificates:
			1. Certify that products are made in USA. Provide steel mill and foundry certificates for verification prior to shipment.
			2. Manufacturer must be American Welding Society Welding Certified for Welding Standards AWS D1.1 and AWS D1.3. Third party qualification documentation required prior to shipment.
	2. DELIVERY, STORAGE, AND HANDLING
		1. Deliver materials to the job site in good condition and adequately protected against damage as handrails are a finished product.
		2. Inspect rail sections for damage before signing the receipt from the trucking company. Truck driver must note damaged goods on the bill of lading if damaged product is found
		3. Store products in manufacturer's unopened packaging until ready for installation.
		4. Products to be palletized and labeled by roof level or designated drop zone.
	3. PROJECT CONDITIONS
		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.
	4. WARRANTY
		1. Warranty: Provide manufacturer's limited, two year warranty.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Tie Down, which is located at:605 Stonehill Drive S.W.Atlanta, GA 30336Toll Free Tel: 800-241-1806Tel: 404-344-0000Email: [request info (sales@tiedown.com)](https://arcat.com/rfi?action=email&company=Tie%252BDown&message=RE%253A%2520Spec%2520Question%2520(05622tie)%253A%2520&coid=51441&spec=05622tie&rep=&fax=);Web: <https://www.tiedown.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.

\*\* NOTE TO SPECIFIER \*\* Select the fall protection system(s) and components required from the following paragraphs and delete those not required.

* 1. METAL GUARDRAIL AND ROOFTOP FALL PROTECTION
		1. Roof Zone Universal Guardrail Fall Protection System: For use on flat, level roofs only with a maximum pitch of 1/2 inch per foot (.5/12).
			1. General:
				1. RZ Guardrails are manufactured of 1.66 inch O.D. HRPO electric weld tubing, free of sharp edges and snag points.
				2. Receiver Posts have a positive locking system into slots that allow rails to be mounted in any direction.
				3. System has top and mid rail in accordance with OSHA Standards - 29 CFR 1910.23 and 29 CFR 1926.502
				4. Structural Load: 200 lb (90.7 kg), minimum, in any direction to all components in accordance with OSHA Regulations 29 CFR 1910.23 and 29 CFR 1926.502
				5. Designed to Fit Competitors Bases

\*\* NOTE TO SPECIFIER \*\* Select the components required from the following paragraphs and delete those not required. Zip Guardrail is available with a safety yellow finish or pre-galvanized finish and in Pallet quantities of 12. Also available in pallet kits of 11 rails and 12 bases in single pallet and 3 pallet configurations.

* + - 1. Yellow TS 22 Coated Guardrails:
				1. Part No. 70758: 10 foot long, 41.50 inches high with a 19.84 inch mid rail, (29 lbs.)
				2. Part No. 70759: 7.5 foot long, 41.50 inches high with a 19.84 inch mid rail, (21 lbs.)
				3. Part No. 70760: 5 foot, 41.50 inches high with a 19.84 inch mid rail, (14 lbs.)
				4. Part No. 70778: 5 foot D Rail, 41.50 inches high with a 19.84 inch mid rail, (14 lbs.)
				5. Thermo-Plastic TS-22 Coating
				6. Tubal-Inspect Quality Control Analysis
			2. Pre-Galvanized Guardrails:
				1. Part No. 70764: 10 foot long, 41.50 inches high with a 19.84 inch mid rail, Pre-Galvanized (34 lbs.)
				2. Part No. 70765: 7.5 foot long, 41.50 inches high with a 19.84 inch mid rail, Pre- Galvanized (28 lbs.)
				3. Part No. 70766: 5 foot, 41.50 inches high with a 19.84 inch mid rail, Pre- Galvanized (22 lbs.)
			3. Mounting Bases: Fabricated of 1/2 inch HRPO carbon steel plate.
				1. Zip Base: Part No. 70756: 3 hole base, 29.29 inches long by 14.50 inches wide, yellow powder coat with EPDM rubber feet (58 lbs). Base nests and stacks easily for storage before and after use. Zip Base offers superior resistance to impact loads and its unique design is 40 percent lighter than competitor bases. Comes with toe board slots on each side and handle holes for lifting.
				2. Zip Base Extender: Part No. 70757: Used in conjunction with Zip Base #70756. Extender Base is 29.26 inches long by 14.50 inches wide, yellow powder coat with an EPDM rubber foot (42 lbs). Allows for more ballast weight where higher impact load ratings may be required. Extender base stacks for easy storage.
			4. RZ Guardrail Swing Gate
				1. Part No. 70776: RZ Guardrail Gate, 5 foot with Latch kit manufactured of 1.66 inch high strength low alloy steel (HSLA). RZ Swing Gate is uniquely designed with a built-in hinge allowing easy gate placement into guardrail base like a standard safety rail. Each RZ Guardrail swing gate comes with latch, wheel and lock bracket kit.
			5. ZIP Base Dolly
				1. Part No. 70767 Zip Base Dolly with Blade and Flat Free Tires with a yellow powder coat finish.
				2. Part No. 70768 Zip Base Dolly Replacement Blade with a yellow powder coat finish.
			6. ZIP Base Accessories
				1. Part No. 70777: Toe Board Bracket.
				2. Part No. 70754: Zip Base Replacement Rubber Feet (6 each).
				3. Part No. 10500: Safety Locking Pin. Fabricated of 1010 carbon steel, zinc plated and consists of collared pin and lanyard that connects to pin.

\*\* NOTE TO SPECIFIER \*\* Select the Parapet Mount System and components required from the following paragraphs and delete those not required. System comes with everything needed for 355 feet of fall protection, all packed in one stackable container. Zip Rail stackable container comes with forklift pockets on each side and hoisting rings for roof top delivery.

* + 1. Roof Zone Zip Rail Compression Bracket System with Container (Parapet Mount) Part No. 70736:
			1. General:
				1. System allows workers full mobility and access to the roof's edge without the need of either a lanyard and harness or a warning line system.
				2. Compression Bracket Zip Rail System with Container (355 lineal feet).
				3. System meets OSHA fall protection requirements 1926.501(b)(1).
			2. Compression Bracket Part No. 70725
			3. 10 foot Zip Rail - Painted Yellow, Part No. 70733
			4. Adjustable Zip Rail 5 to 8 feet, Zinc Finish, Part No. 70732
			5. Adjustable Zip Rail 32 to 48 inches, Zinc Finish, Part No. 70731
			6. Zip Rail Stanchions Painted Yellow, Part No. 70728
			7. Corner Bracket Assembly Painted Yellow, Part No. 70730
			8. Safety Locking Pin, Part No. 10500
			9. Zip Rail Stack Container

\*\* NOTE TO SPECIFIER \*\* Select the Gravel Stop System and components required from the following paragraphs and delete those not required. System comes with everything needed for 420 feet of fall protection, all packed in one stackable container. Zip Rail stackable container comes with forklift pockets on each side and hoisting rings for roof top delivery.

* + 1. Tie Down Zip Rail Gravel Stop System with Container Part No. 70755
			1. General:
				1. System allows workers full mobility and access to the roof's edge without the need of either a lanyard and harness or a warning line system.
				2. Gravel Stop System with Container (420 feet). Part No. 70755
				3. System meets OSHA fall protection requirements 1926.501(b)(1).
			2. Gravel Stop Bracket Part No. 70723
			3. 10 foot Zip Rail - Painted Yellow, Part No. 70733
			4. Adjustable Zip Rail 5 to 8 feet, Zinc Finish, Part No. 70732
			5. Adjustable Zip Rail 32 to 48 inches, Zinc Finish, Part No. 70731
			6. Zip Rail Stanchions Painted Yellow Part No. 70728
			7. Corner Bracket Assembly Painted Yellow Part No. 70730
			8. Safety Locking Pin Part No. 10500
			9. Zip Rail Stack Container
		2. Tie Down Steep Slope Guardrail Part No. 65014:
			1. Steep Slope Guardrail bracket has 5 adjustable pitch positions from 4/12 to 16/12.
			2. Adjustable rail brackets for easy and fast attached of 2 x 4's (not included).
			3. Maximum spacing 8 feet.
			4. Complies to OSHA standards.
		3. Tie Down Rake Edge Bracket Part No. 65023:
			1. For use on all rake edges or eaves with 4/12 pitch or less.
			2. Designed for use with the RoofZone 65014 Steep Slope Guardrail System.
			3. Rake bracket fits under shingle tabs for quick positioning and removal.
			4. Key-hole nail openings for 16 inch or 24 inch spacing.
			5. Maximum spacing 8 feet apart.
			6. Features toe board openings for proper placement, and laser cut Pre-galvanized 1.5 inch heavy-duty post with self-locking rail brackets.
			7. Complies with OSHA standards.
		4. Tie Down Galvanized Roof Anchor Part No. 48591: Fall arrest anchor for a single user on a low slope roof application (4/12 pitch or less) on wood decking, corrugated steel roof decking and concrete.
			1. Welded Steel Galvanized Anchorage Device
			2. U-rod Cross Section: .625 inch
			3. Base: 16inches by 16 inches Square
			4. Base thickness: 3/8 inch
			5. Strength Rating: 5,000 lbs
			6. Capacity: 310 lbs (Worker with Tools)
	1. OVERHEAD FALL ARREST SYSTEM
		1. Overhead Fall Arrest: Alsipercha system is a personal fall protection system that provides an exceptional overhead anchorage connection.
			1. General:
				1. Allows the operator to work safely covering an area of 1345.49 SF and moving within a radius of 17,9 feet around the vertical boom.
				2. Inverted "L" shaped metal structure measuring 8 feet 2 inches long and 14 feet 1 inch high (11 feet 5 inches when attached to the column).
				3. Metal structure weighs 176.37 lbs and is made of high quality steel.
				4. Retractable device measuring 10 feet maximum length.
				5. Housing steel tube of 3 foot height.
				6. System designed for columns spaced at up to 26 feet (8 M) intervals.
				7. Engineered to ANSI Z359.6 and CSA Z259.16 standards.
				8. Meets OSHA 1926 Sub M App C and OSHA 1910 Sub I App D
			2. Alsipercha "L" Frame Assembly:
				1. Inverted "L" Frame Structure with energy-absorber device Part No. 13891. Installs into the Conical Tube, Column Clamp or Tripod.
				2. Hook: Part No. 13896. Used to bring the fall arrest system closer to the worker when changing.
				3. Sling: Part No. 13910. Used to move the assembly with the use of a crane.
				4. Personnel Harness: Part No. xxxxx.
				5. Self retracting Device: Part No. xxxxx. Locks on a sudden acceleration.
				6. Lanyard Connector: Part No. xxxxx. Component joining the operator to the retractable device with 18 inch maximum length.
				7. Hook: Part No. 13896. Used to bring the assembly closer to the worker when change anchorage to an adjacent "L" Frame Structure.

\*\* NOTE TO SPECIFIER \*\* Select the system configuration required from the following paragraphs and delete those not required.

* + - 1. Conical Tube System: Personal overhead fall protection system for framework decking, installation of guardrails, gallows-type safety nets, framework risers, and in general all framework assembly activities that entail the risk of falling from heights.
				1. Tube Component Part No.13890 is cast into concrete columns that houses the Alsipercha fall arrest system.
				2. Leveling element Part No.13897 is introduced into the cast-in tube to ensure it's vertical and prevent the tube from rising during concrete placement.
			2. Column Clamp System: Column clamp accessory consists of a pair of adjustable clamps distanced by 3 feet, and a bottom sleeve where the Alsipercha is then going to be positioned.
				1. Column Clamp Part No. 13893 (two required). Used to anchor the Alsipercha body to steel wide flange columns sized from 6 inches to 18 inches.
				2. Column Clamp Sleeve Part No. 13894: Serves as a housing for the Alsipercha main bod
			3. Tripod System: Tripod provides a wide range of potential uses, being specially effective for loading-unloading vehicles, a critical stage where there is a high risk of users falling from height.
				1. Tripod Component Part No.13892. Used to stabilize the Alsipercha. Systems range in height between 16.5 feet to 23 feet.
			4. Counterweight MF System is a modular structure that, using the vehicle weight as counterweight, guarantees an effective use of the Alsipercha when working at height over vehicles.

\*\* NOTE TO SPECIFIER \*\* Select the height required from the following paragraphs and delete the one not required.

* + - * 1. 18 foot height
				2. 21 foot height.

\*\* NOTE TO SPECIFIER \*\* Select the commercial roof anchor(s) required from the following paragraphs and delete those not required.

* 1. COMMERCIAL ROOF ANCHORS
		1. Commercial Roof Anchors: Single user in fall arrest or restraint, as part of an HLL system or for window washing tie-off. Do not connect more than one worker to an anchor. For use on a low slopped roof 4/12 pitch or less unless otherwise specified by the manufacturer..
			1. General:
				1. Material Schedule 40 steel with hot dip galvanized finish.
				2. Loop Top Fixture: .625 inch welded loop designed for compatibility with snaphooks, carabiners, and SAS HLL fixtures.
				3. Meets or exceeds all applicable OSHA 1926 Subpart M, OSHA 1910, ANSI Z359.1-2007, and ANSI A10.32-2012 standards for fall protection.
				4. Ultimate Strength Capacity : 5,000 lbs in any direction. Capacity: 420 lbs
			2. Riser: 8 inch, 3 inch O.D.
				1. Part No. 70864-L16: 3/8 inch thick, Screw On/Bolt On, 16 inch by 16 inch base with 40 Wood and Metal and 8 Concrete predrilled holes
				2. Part No. 70864-L11: 3/8 inch thick, Bolt On, 11 inch by 11 inch base with 8 Concrete predrilled holes.
				3. Part No. 70861-LF: Field Weld, 5/16 inch.
			3. Riser: 12 inch, 3 inch O.D.
				1. Part No. 70864-L16: 3/8 inch thick, Screw On/Bolt On, 16 inch by 16 inch base with 40 Wood and Metal and 8 Concrete predrilled holes
				2. Part No. 70864-L11: 3/8 inch thick, Bolt On, 11 inch by 11 inch base with 8 Concrete predrilled holes.
				3. Part No. 70864-LF: Field Weld, 5/16 inch.
			4. Riser: 18 inch, 3 inch O.D.
				1. Part No. 70870-L16: 3/8 inch thick, Screw On/Bolt On, 16 inch by 16 inch base with 40 Wood and Metal and 8 Concrete predrilled holes.
				2. Part No. 70870-L11: 3/8 inch thick, Bolt On, 11 inch by 11 inch base with 8 Concrete predrilled holes.
				3. Part No. 70870-LF: Field Weld, 5/16 inch.
			5. Riser: 24 inch, 4 inch O.D.
				1. Part No. 70873-L16: 1/2 inch thick, Bolt On, 16 inch by 16 inch base with 16 Concrete predrilled holes.
				2. Part No. 70873-L11: 1/2 inch thick, Bolt On, 11 inch by 11 inch base with 16 Concrete predrilled holes.
				3. Part No. 70873-LF: Field Weld, 5/16 inch.
			6. Riser: 36 inch, 4 inch O.D.
				1. Part No. 70879-L16: 5/8 inch thick, Bolt On, 16 inch by 16 inch base with 16 Concrete predrilled holes.
				2. Part No. 70879-L11: 5/8 inch thick, Bolt On, 11 inch by 11 inch base with 16 Concrete predrilled holes.
				3. Part No. 70879-LF: Field Weld, 5/16 inch.
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.
	4. PROTECTION
		1. Protect installed products until completion of project.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION