

SECTION 23 05 29

HANGERS AND SUPPORTS FOR HVAC PIPE AND EQUIPMENT

\*\* NOTE TO SPECIFIER \*\* MIRO Industries Inc.; Rooftop Support Products.
This section is based on the products of MIRO Industries Inc., which is located at:
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MIRO Industries was founded over 30 years ago to provide solutions to the needs of contractors, consultants, engineers and architects in designing supports for rooftop equipment in both commercial and industrial applications. MIRO exists to find solutions to you specific building needs.
A building's roof is one of its most important elements, and its integrity most be maintained regardless of the equipment it supports. Whether used during new construction or retrofit, MIRO Rooftop Supports distribute load over the maximum appropriate surface area to avoid surface penetrations, and the materials used help to mitigate other types of potential damage.
Whether supporting various types of pipe supply/return lines, ducting, HVAC equipment, conduit/cable trays, or in providing maintenance access via walkways, crossover bridges, ramps or service platforms, MIRO Industries Rooftop Support Products offer off-the-shelf and custom solutions to meet and exceed your expectations.
Our team of representatives, inside sales, and engineers will ensure your support system is pre-planned, designed, stamped and installed. From start to completion, we go the extra mile to earn your confidence and meet your expectations. Each contract is a relationship building opportunity. MIRO can provide engineering and weight load calculations on our support systems. We are proud to be the only rooftop support company in the industry that offers a 20 year warranty. MIRO products are made in the USA, we have a strong relationship with our suppliers and stand behind our brand and products.

1. GENERAL
	1. SECTION INCLUDES

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

* + 1. Rooftop support products including:
			1. Pillow block pipe supports.
			2. Roller support series.
			3. Baser Strut support series.
			4. Custom hanger support series.
			5. Custom duct and cable tray support series.
			6. Mechanical supports.
			7. Surefoot access products.
			8. Specialty engineered products.
			9. Accessories.
	1. RELATED SECTIONS
		1. Section 05 10 00 - Metal Stairs

\*\* 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 05 51 19 - Metal Grating Stairs
		3. Section 05 51 36 - Metal Walkways
		4. Section 05 51 36.13 - Metal Catwalks
		5. Section 05 51 36 - Metal Ramps
		6. Division 07 - Thermal and Moisture Protection.
		7. Section 07 70 00 – Roof Accessories
		8. Section 07 72 00 – Roof Accessories
		9. Section 07 72 40 - Rooftop Walkways.
		10. Section 07 72 55 - Rooftop Pipe Support Systems
		11. Division 21 – Fire Suppression
		12. Section 21 05 29 - Hangers and Supports for Fire Suppression Pipe.
		13. Division 22 – Plumbing
		14. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment.
		15. Division 23 – Heating, Ventilating, and Air Conditioning (HVAC)
		16. Division 26 - Electrical
		17. Section 26 05 29 - Hangers and Supports for Electrical Systems
	1. REFERENCES

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

* + 1. ASTM International (ASTM):
			1. ASTM A1011 SS GR33 - Standard Specification for hot rolled carbon steel sheet and strip, structural quality. (Hot Rolled Channel - Hot-Dipped Galvanized Finish).
			2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
			3. ASTM A153 - Standard Specification for zinc Coating (Hot-Dip) on Iron and Steel Hardware.
			4. ASTM A525 - Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
			5. ASTM A653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
			6. ASTM D1621 – Standard Test for Compressive Properties of Rigid Cellular Plastics
			7. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
		2. American National Standards Institute (ANSI):
			1. ANSI / MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application and Installation.
			2. ANSI / MSS SP-69 - Pipe Hangers and Supports - Selection and Application.
			3. ANSI / MSS SP-127 - Bracing for Piping Systems Seismic-Wind-Dynamic Design, Selection and Application.
		3. American Iron and Steel Institute (AISI):
			1. AISI Specifications for the Design of Cold-Formed Steel Structural Members
		4. American Institute of Steel Construction (AISC):
			1. Steel Construction Manual
		5. American Society of Civil Engineers (ASCE):
			1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
		6. International Code Council (ICC):
			1. International Building Code.
			2. International Mechanical Code.
			3. International Fuel and Gas Code.
			4. International Plumbing Code.
			5. National Electric Code, NFPA 70
		7. Occupational Safety and Health Administration (OSHA):
			1. Safety and Health Regulations for Construction, Fall Protection.
			2. OSHA 1910, Subpart D, Walking and Working Surfaces.
		8. Sheet Metal and Air Conditioning Contractors’ National Association, INC (SMACNA):
			1. HVAC Duct Construction Standards
	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:
			1. Show installation layout, sizes of supports, rooftop component sizes, materials used, and details of installation.
			2. Show details of each roofing system including material layers and thicknesses, flashing, terminations, and penetrations with each rooftop support system to be installed.
			3. All supports shall be pre-assembled and shipped for turnkey installation. Indicate all steps and preparation required by others including assembly instructions.
			4. For engineered systems, provide project specific, engineered stamped shop drawings and calculations including extents of installation, load bearing capacity and structural requirements.
		4. Deferred Submittals and Delegated Designs:
			1. To meet documentation requirements per IBC [A] 107.3.4, provide a MIRO Industries rooftop support deferred submittal that meet project specific design criteria and contain the following:
				1. Calculations showing the IBC and ASCE 7 loading and how it is applied to the frames.
				2. Drawings showing how the frames are to be built, materials and finishes used, and connection details back to the structure.
				3. Roof layouts dictating where frames are intended to be installed to support the rooftop components.
			2. These documents are to be stamped by a licensed registered professional in the jurisdiction.
			3. The document is to be submitted to the owner and their consultants to review and approve prior to commencement of fabrication.
		5. Verification Samples: Provide two full size units for each product to be installed.
		6. Manufacturer's Certification:
			1. New Construction Product Certificates: Manufacturer's product certification includes review and provided products in accordance with approved and accepted HVAC, Plumbing, Electrical, or Equipment plans provided by others. Manufacturer is not responsible for evaluation, design, or certification of the building structure or equipment being supported. General Contractor shall verify project conditions prior to ordering products or submitting to manufacturer for review.
			2. Additions/Renovations Product Certificates: Manufacturer's product certification includes review and provided products in accordance with approved and accepted HVAC, Plumbing, Electrical, or Equipment plans provided by others. Manufacturer is not responsible for evaluation, design, or certification of the building structure or equipment being supported. All existing conditions, dimensions, locations and elevations of existing equipment shall be verified by the General Contractor in the field and coordinated with new construction prior to preparation of shop drawings, fabrication, or commencement of work. If discrepancies are discovered between existing conditions and new work, the General Contractor shall immediately notify the Manufacturer prior to performance of shop drawings, fabrication, or commencement of work.
			3. Installer Qualifications: Certified by the manufacturer.
	2. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company with minimum 20 years of experience and specializing in the manufacture and distribution of engineered rooftop support systems.
			1. Manufacturer's custom work process shall include the following steps:
				1. Project concept development and consulting.
				2. Design and engineering including quantity and type of supports and accessories.
				3. Fabrication and delivery.
				4. On site evaluation that installation meets specifications herein and manufacturer requirements.
				5. Owner training and maintenance instruction.
		2. Installer Qualifications: Approved by the manufacturer, with minimum 5 years of experience installing similar products.

\*\* 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 is approved by Architect or Engineer.
			3. Refinish mock-up area as required to produce acceptable work.
	1. PRE-INSTALLATION MEETINGS
		1. After approval of submittals, but before beginning installation, conduct a meeting at the Project site including:
			1. Attendance shall include the Architect, Engineer, Contractor, roofing installers, mechanical, electrical and other trades whose work will be installed in support system.
			2. Describe the installation process in detail to establish responsibilities and project specific requirements and site logistics.
			3. Prepare detailed meeting report and distribute to all attendees.
	2. DELIVERY, STORAGE, AND HANDLING
		1. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification, product model names and catalog numbers, and related information until ready for installation.
		2. Store materials off the ground under ventilated covers until ready for installation.
		3. Handle materials to avoid damage.
	3. PROJECT CONDITIONS
		1. Quantity Take Off: A manufacturer certified technician shall perform on-site quantity take-off including the following:
			1. Field measurements.
				1. Where field measurements are not possible during design or construction, show control dimensions and project specific information on shop drawings.
			2. Design and layout.
			3. Product designation and tagging.
		2. Do not install products under environmental conditions outside manufacturer's recommended limits.
		3. Coordinate with roofing, mechanical, electrical and other related trades as required.
	4. SEQUENCING
		1. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
	5. WARRANTY
		1. Provide manufacturers standard product warranty against defects in manufacturing, proper operation, and against damaging roofing membrane when products are installed in accordance with engineered shop drawings and manufacturer's instructions. Warranty is not a maintenance agreement, insurance policy, or obligation to repair leaks determined to be a result of the building design, installation, construction error, misuse of system, failure to inspect or maintain system, or other limitations in manufacturer's standard warranty.
			1. Warranty Period: 20 years.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: MIRO Industries Inc., which is located at: 844 S. 430 W. Suite 100; Heber City, UT 84032; Toll Free Tel: 800-768-6978; Tel: 801-975-9993; Fax: 800-440-7958; Email:sales@miroind.com; Web: [www.miroind.com](http://www.miroind.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. GENERAL
		1. Unique design absorbs thermal expansion and contraction of supported components to prevent damage to roofing membranes using non-corrosive bases that rest on roofing membranes including:
			1. Gently rounded edges to prevent damage to roofing membrane.
			2. Drainage ports to prevent ponding.
			3. Carbon black additive in polycarbonate for UV stabilization, stainless steel and hot-dipped galvanized bases are available as specified below.
		2. Loading and Design Constraints:
			1. Design values are based on rooftop applications only. For other applications contact manufacturer for allowable loading.
			2. Maximum loading from any type of MIRO base to finished roof surface not to exceed 3.0 psi (0.021 Mpa) for dead loads, 5.0 psi (0.034 Mpa) for short duration dead combined with live loads, or otherwise specifically indicated in project specifications.
			3. Horizontal deflection not to exceed the span length divided by 240 (*l/240)* or 1/4 inch (6.35 mm).
			4. Maximum spacing allowed by component type and structural attachment requirements by component type to be based on the following codes and standards:
				1. International Mechanical Code, Section 305
				2. International Fuel and Gas Code, Section 407, 415
				3. International Plumbing Code Section, 308
				4. SMACNA HVAC Duct Construction Standards, Metal and Flexible, Section 4.2
				5. NFPA 70 (NEC) Section 342, 352
				6. Any other codes and standards not previously mentioned, including local building codes and standards, to support specific components as required to meet project specific requirements.
		3. Include manufacturer’s pipe guides, spacers, clamps, support pads, brackets, bracing, attachments, and any other recommended accessories.

\*\* NOTE TO SPECIFIER \*\* Select supports to be installed. Clearance from roof may vary if pipe layers cross over or under each other. Coordinate as needed. Delete if not required.

* 1. PILLOW BLOCK PIPE SUPPORTS

\*\* NOTE TO SPECIFIER \*\* Pillow Block supports are easy-to-install, low-cost solutions to many of you rooftop support needs. Designed for both fixed and adjustable applications, the various models carry anything from gas lines, electrical conduit, solar lines, and just about any other mechanical piping. The load-dispersing food design can be used in conjunction with spacers as needed, or can be used on its own without risk of compromising a roof membrane. All Pillow Block Supports are made of 100% UV stable Polycarbonate.

* + 1. 1.5 - Pillow Block: Pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 6 inch (152 mm) square
			3. Pipe Clearance: Fixed height of 2 inch (50.8 mm).
			4. Maximum Load Weight: 72 pounds (33 kg) per pipestand.
			5. Pipe Rest: "U" shaped cradle in a polycarbonate resin seat.
			6. Support is designed to carry up to a 1-1/2 inch pipe with a max outside diameter of 1.9 inches (48.3 mm).
			7. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 7 foot (2 m) centers, as loading permits.
		2. 1.5 – Link and Truss: Stackable and linkable pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 7-1/4 by 4-7/16 inch (184 mm by 113 mm) per unit, unit can be linked
			3. Pipe Clearance: Fixed height of 2 inch (50.8 mm). Each truss accessory increases the clearance of the pipe by an additional 3 inches (76.2 mm).
			4. Maximum Load Weight: 70 pounds (32 kg) per pipestand.
			5. Pipe Rest: "U" shaped cradle in a polycarbonate resin seat.
			6. Support is designed to carry up to a 1-1/2 inch pipe with a max outside diameter of 1.9 inches (48 mm).
			7. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 7 foot (2 m) centers, as loading permits.
		3. 3.0 - Pillow Block: Pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 7-3/4 inch (197 mm) square.
			3. Pipe Clearance: Fixed height of 5 inch (127 mm). Each 3-R spacer increases the clearance of the pipe by 2 inch (50 mm).
			4. Maximum Load Weight: 120 pounds (54 kg) per pipestand.
			5. Pipe Rest: "U" shaped cradle in a polycarbonate resin seat.
			6. Support is designed to carry up to a 3 inch pipe or an insulated pipe with a max outside diameter of 3.6 inches (91 mm).
			7. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
		4. 3-R-2 - Pillow Block: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 7-3/4 inch (197 mm) square.
			3. Pipe Clearance: Fixed height of 2-1/8inch (54 mm). Each 3-R spacer increases the clearance of the pipe by 2 inch (50 mm).
			4. Maximum Load Weight: 118 pounds (53 kg) per pipestand.
			5. Pipe Rest: Self-lubricating polycarbonate resin roller and axle.
			6. Support is designed to carry up to a 3 inch pipe with a maximum outside diameter of 3-3/4 inches (95 mm).
			7. Top of the Cradle: 4 inch (102 mm).
			8. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 7 foot (2 m) centers, as loading permits.
		5. 3-R-4 - Pillow Block: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 7-3/4 inch (197 mm) square.
			3. Pipe Clearance: Fixed height of 4-1/8 inch (105 mm). Each 3-R spacer increases the clearance of the pipe by 2 inch (50 mm).
			4. Maximum Load Weight: 118 pounds (53 kg) per pipestand.
			5. Pipe Rest: Self-lubricating polycarbonate resin roller and axle.
			6. Support is designed to carry up to a 3 inch pipe with a maximum outside diameter of 3-3/4 inches (95 mm).
			7. Top of the Cradle: 4 inch (102 mm).
			8. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 7 foot (2 m) centers, as loading permits.
	1. ROLLER SUPPORT SERIES

\*\* NOTE TO SPECIFIER \*\* Roller Series supports are designed specifically for use in expansion/contraction applications, with a roller to allow for unlimited longitudinal movement while securely maintaining lateral placement. These low maintenance designs use self-lubricating rollers, UV and temperature-stable polycarbonate, all stainless steel or hot-dip galvanized hardware, and for added security pipe guides can be provided as an accessory item. Support bases are also available in stainless steel. All bases can be combined with a rubber Support Pad for added protection. Built to accommodate pipe from 1" to 10", the Dynamic Series models can lift pipe from 3-1/2" to 17-3/4" off the roof surface. (Supports can be customized to meet project specific requirements.)

* + 1. 2-RAH-5: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 7-1/2 by 10 inch (190 by 254 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 5 inch (127 mm) down to a minimum of 3-5/8 inch (92 mm).
			4. Maximum Load Weight, Polycarbonate: 140 pounds (63.5 kg) per pipestand.
			5. Pipe Rest: Self-lubricating polycarbonate resin roller, axle and collar.
			6. Support All-Thread and Metal Parts: Stainless Steel.
			7. Support is optimally designed to carry up to a 2 inch pipe.
			8. Maximum pipe outside diameter (with insulation) is 2-1/2 inches (63.5 mm).
			9. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			10. If supporting insulated pipe, a shield or saddle shall be used.
		2. 3-RAH-8: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 7-1/2 by 10 inch (190 by 254 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 8 inch (203 mm) down to a minimum of 3-7/8 inch (98 mm).
			4. Maximum Load Weight, Polycarbonate: 172 pounds (78 kg) per pipestand.
			5. Pipe Rest: Self-lubricating polycarbonate resin roller, axle and collar.
			6. Support All-Thread and Metal Parts: Stainless Steel.
			7. Support is optimally designed to carry up to a 3 inch pipe.
			8. Maximum pipe outside diameter (with insulation) is 5-1/2 inches (140 mm).
			9. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			10. If supporting insulated pipe, a shield or saddle shall be used.
		3. 3-RAH-12: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 7-1/2 by 10 inch (190 by 254 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 12 inch (305 mm) down to a minimum of 3-7/8 inch (98 mm).
			4. Maximum Load Weight: 172 pounds (78 kg) per pipestand.
			5. Pipe Rest: Self-lubricating polycarbonate resin roller, axle, and collar.
			6. Support All-Thread and Metal Parts: Stainless Steel.
			7. Support is optimally designed to carry up to a 3 inch pipe.
			8. Maximum pipe outside diameter (with insulation) is 5-1/2 inches (140 mm).
			9. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			10. If supporting insulated pipe, a shield or saddle shall be used.
		4. 4-RAH-8 SS: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Type 304 Stainless Steel.
			2. Deck Base: 12 by 16 inch (305 by 406 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 8 inch (203 mm) down to a minimum of 3-3/4 inch (95 mm).
			4. Maximum Load Weight on Base: 419 pounds (190 kg) per pipestand.
			5. Pipe Rest: Self-lubricating polycarbonate resin roller, axle and collar.
			6. Support All-Thread and Metal Brackets: Stainless Steel or Hot-Dipped Galvanized.
			7. Support is optimally designed to carry up to a 4 inch pipe.
			8. Maximum pipe outside diameter (with insulation) is 5-1/2 inches (140 mm).
			9. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			10. If supporting insulated pipe, a shield or saddle shall be used.
		5. 4-RAH-10: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 9 by 15-1/4 inch (228 by 387 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 9-5/8 inch (245 mm) down to a minimum of 4-1/2 inch (114 mm).
			4. Maximum Load Weight on Base: 335 pounds (152 kg) per pipestand.
			5. Pipe Rest: Self-lubricating polycarbonate resin roller, axle and collar.
			6. Support All-Thread and Metal Brackets: Stainless Steel or Hot-Dipped Galvanized.
			7. Support is optimally designed to carry up to a 4 inch pipe.
			8. Maximum pipe outside diameter (with insulation) is 5-1/2 inches (140 mm).
			9. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			10. If supporting insulated pipe, a shield or saddle shall be used.
		6. 4-RAH-12 SS: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Type 304 Stainless Steel.
			2. Deck Base: 12 by 16 inch (305 by 406 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 12 inch (305 mm) down to a minimum of 3-3/4 inch (95 mm).
			4. Maximum Load Weight on Base: 186 pounds (84 kg) per pipestand.
			5. Pipe Rest: Self-lubricating polycarbonate resin roller, axle, and collar.
			6. Support All-Thread and Metal Parts: Stainless Steel.
			7. Support is optimally designed to carry up to a 4 inch pipe.
			8. Maximum pipe outside diameter (with insulation) is 5-1/2 inch (140 mm).
			9. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			10. If supporting insulated pipe, a shield or saddle shall be used.
		7. 4-RAH-14: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 9 by 15-1/4 inch (228 by 387 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 13-5/8 inch (346 mm) down to a minimum of 4-1/2 inch (114 mm).
			4. Maximum Load Weight: 186 pounds (84 kg) per pipestand.
			5. Pipe Rest: Self-lubricating polycarbonate resin roller, axle, and collar.
			6. Support All-Thread and Metal Parts: Stainless Steel.
			7. Support is optimally designed to carry up to a 4 inch pipe.
			8. Maximum pipe outside diameter (with insulation) is 5-1/2 inches (140 mm)
			9. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			10. If supporting insulated pipe a shield or saddle shall be used.
		8. 5-RAH-8: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 9 by 15-1/4 inch (228 by 387 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 8 inch (203 mm) down to a minimum of 3-3/4 inch (95 mm).
			4. Maximum Load Weight: 335 pounds (152 kg) per pipestand.
			5. Pipe Rest: Self-lubricating polycarbonate resin roller.
			6. Support All-Thread, Axle, and Metal Parts: Stainless Steel.
			7. Support is optimally designed to carry up to a 5 inch pipe.
			8. Maximum pipe outside diameter (with insulation) is 8-1/2 inches (216 mm).
			9. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			10. If supporting insulated pipe, a shield or saddle shall be used.
		9. 5-RAH-12: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 9 by 15-1/4 inch (228 by 387 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 12 inch (305 mm) down to a minimum of 3-3/4 inch (895 mm).
			4. Maximum Load Weight: 335 pounds (152 kg) per pipestand.
			5. Pipe Rest: Self-lubricating polycarbonate resin roller.
			6. Support All-Thread, Axle, and Metal Parts: Stainless Steel.
			7. Support is optimally designed to carry up to a 5 inch pipe.
			8. Maximum pipe outside diameter (with insulation) is 8-1/2 inches (216 mm).
			9. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			10. If supporting insulated pipe a shield or saddle shall be used.
		10. 6-RAH-8: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:

\*\* NOTE TO SPECIFIER \*\* Select polycarbonate or stainless steel. Stainless steel base will include type 304 stainless steel metal base, confirm details with manufacturer. Delete base material if not required.

* + - 1. Base Material: Polycarbonate.
				1. Deck Base: 16 by 18 inch (406 by 457 mm).
				2. Pipe Clearance: Adjustable from the factory set maximum height of 8 inch (203 mm) down to a minimum of 4-3/8 inch (111 mm).
				3. Maximum Load Weight: 578 pounds (262 kg) per pipestand.
			2. Base Material: Type 304 Stainless Steel. (Model 6-RAH-8 SS)
				1. Deck Base: 12 by 16 inch (305 by 406 mm).
				2. Pipe Clearance: Adjustable from the factory set maximum height of 8 inch (203 mm) down to a minimum of 2-7/8 inch (73 mm).
				3. Maximum Load Weight: 524 pounds (238 kg) per pipestand.
			3. Pipe Rest: Self-lubricating polycarbonate resin roller.
			4. Support All-Thread, Axle, and Metal Parts: Stainless Steel.
			5. Support is optimally designed to carry up to a 6 inch pipe.
			6. Maximum pipe outside diameter (with insulation) is 8-1/2 inch (216 mm).
			7. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			8. If supporting insulated pipe a shield or saddle shall be used.
		1. 6-RAH-12 - Dynamic: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:

\*\* NOTE TO SPECIFIER \*\* Select polycarbonate or stainless steel. Stainless steel base will include type 304 stainless steel metal base, confirm details with manufacturer. Delete base material if not required.

* + - 1. Base Material: Polycarbonate.
				1. Deck Base: 16 by 18 inch (406 by 457 mm).
				2. Pipe Clearance: Adjustable from the factory set maximum height of 12 inch (305 mm) down to a minimum of 4-3/8 inch (111 mm).
				3. Maximum Load Weight: 578 pounds (262.18 kg) per pipestand.
			2. Base Material: Type 304 Stainless Steel. (Model 6-RAH-12 SS)
				1. Deck Base: 12 by 16 inch (305 by 406 mm).
				2. Pipe Clearance: Adjustable from the factory set maximum height of 12 inch (305 mm) down to a minimum of 2-7/8 inch (73 mm).
				3. Maximum Load Weight: 524 pounds (238 kg) per pipestand.
			3. Pipe Rest: Self-lubricating polycarbonate resin roller.
			4. Support All-Thread, Axle, and Metal Brackets: Stainless Steel.
			5. Support is optimally designed to carry up to a 6 inch pipe.
			6. Maximum pipe outside diameter (with insulation) is 8-1/2 inch (216 mm).
			7. Spacing: Horizontal support spacing per pipe specification or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			8. If supporting insulated pipe, a shield or saddle shall be used.
		1. 10-RAH-8 - Dynamic: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 19 by 23 inch (482 by 584 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 8 inch (203 mm) down to a minimum of 6 inch (152 mm).
			4. Maximum Load Weight: 960 pounds (435 kg) per pipestand.
			5. Roller Material: Composite rubber.
			6. Support All-Thread, Axle and hardware: Stainless Steel.
			7. Support is optimally designed to carry up to a 10 inch pipe.
			8. Maximum pipe outside diameter (with insulation) is 13 inches (330 mm).
			9. Spacing: Horizontal support spacing per pipe specification or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			10. If supporting insulated pipe, a shield or saddle shall be used.
		2. 10-RAH-18: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other plumbing and mechanical piping with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 19 by 23 inch (482 by 584 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 17-3/4 inch (451 mm) down to a minimum of 6 inch (152 mm).
			4. Maximum Load Weight: 803 pounds (364 kg) per pipestand.
			5. Roller Material: Composite rubber.
			6. Support All-Thread, Axle and hardware: Stainless Steel.
			7. Support is optimally designed to carry up to a 10 inch pipe.
			8. Maximum pipe outside diameter (with insulation) is 13 inches (330 mm).
			9. Spacing: Horizontal support spacing per pipe specification or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			10. If supporting insulated pipe, a shield or saddle shall be used.

\*\* NOTE TO SPECIFIER \*\* Select conduit and condensate supports to be installed. Clearance from roof may vary if pipe layers cross over or under each other. Coordinate as needed. Delete if not required.

* 1. STRUT SUPPORT SERIES

\*\* NOTE TO SPECIFIER \*\* Strut Series supports are designed to accommodate conduit, electrical and solar pipes, as well as all kinds of mechanical piping or a random mix of distribution lines. These models can be set up in widths from a single base or multiple base configurations. With option that will support components as low as 2-1/2" or up to 18" off the roof, and allowable loads ranging from 172.5 lbs. to 960 lbs. practically any low-rise support needs can be met. All bases are either UV-stable polycarbonate or stainless steel and are designed with adequate footprint to balance each supports design loads. All bases can be combined with a rubber Support Pad for added protection. All hardware is stainless steel or hot-dip galvanized, and for added security pipe clamps can be provided upon request. (Supports can be customized to meet project specific requirements.)

* + 1. 8-Base Strut-2: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 7-1/2 by 10 inch (190 by 254 mm).
			3. Pipe Clearance: Fixed 2-1/2 inch (64 mm).
			4. Maximum Load Weight: 172 pounds (78 kg) per pipestand.
			5. Pipe Rest: 8 inch (203 mm) hot-dipped galvanized steel struts connected with hot-dipped galvanized bolts to the base.
			6. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			7. If supporting insulated pipe, a shield or saddle shall be used.
			8. Strut clamps may be used to attach components to the support.
		2. 8-Base Strut-5: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 7-1/2 by 10 inch (190 by 254 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 5-3/8 inch (137 mm) down to a minimum of 3-1/2 inch (89 mm).
			4. Maximum Load Weight: 172 pounds (78 kg) per pipestand.
			5. Pipe Rest: 8 inch (203 mm) hot-dipped galvanized steel struts connected with stainless steel all thread to the base.
			6. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			7. If supporting insulated pipe, a shield or saddle shall be used.
			8. Strut clamps may be used to attach components to the support.
		3. 8-Base Strut-8: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:

\*\* NOTE TO SPECIFIER \*\* Select polycarbonate or stainless steel. Stainless steel base will include type 304 stainless steel metal base, confirm details with manufacturer. Delete base material if not required.

* + - 1. Base Material: Polycarbonate.
				1. Deck Base: 7-1/2 by 10 inch (190 by 254 mm).
				2. Pipe Clearance: Adjustable from the factory set maximum height of 8-7/8 inch (225 mm) down to a minimum of 3-1/2 inch (89 mm).
				3. Maximum Load Weight: 172 pounds (78 kg) per pipestand.
			2. Base Material: Type 304 Stainless Steel. (Model 8-Base Strut-8 SS)
				1. Deck Base: 12 by 16 inch (305 by 406 mm).
				2. Pipe Clearance: Adjustable from the factory set maximum height of 8-7/8 inch (225 mm) down to a minimum of 3-1/8 inch (79 mm).
				3. Maximum Load Weight: 419 pounds (190 kg) per pipestand.
			3. Pipe Rest: 8 inch (203 mm) hot-dipped galvanized steel struts connected with stainless steel all thread to the base.
			4. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			5. If supporting insulated pipe, a shield or saddle shall be used.
			6. Strut clamps may be used to attach components to the support.
		1. 8-Base Strut-12: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:

\*\* NOTE TO SPECIFIER \*\* Select polycarbonate or stainless steel. Stainless steel base will include type 304 stainless steel metal base, confirm details with manufacturer. Delete base material if not required.

* + - 1. Base Material: Polycarbonate.
				1. Deck Base: 7-1/2 by 10 inch (190 by 254 mm).
				2. Pipe Clearance: Adjustable from the factory set maximum height of 12-7/8 inch (327 mm) down to a minimum of 3-1/2 inch (89 mm).
				3. Maximum Load Weight: 172 pounds (78 kg) per pipestand.
			2. Base Ma Material: Type 304 Stainless Steel. (Model 8-Base Strut-12 SS)
				1. Deck Base: 12 by 16 inch (305 by 406 mm).
				2. Pipe Clearance: Adjustable from the factory set maximum height of 12-7/8 inch (327 mm) down to a minimum of 3-1/8 inch (79 mm).
				3. Maximum Load Weight: 186 pounds (84 kg) per pipestand.
			3. Pipe Rest: 8 inch (203 mm) hot-dipped galvanized steel struts connected with stainless steel all thread to the base.
			4. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			5. If supporting insulated pipe, a shield or saddle shall be used.
			6. Strut clamps may be used to attach components to the support.
		1. 12-Base Strut-8: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:

\*\* NOTE TO SPECIFIER \*\* Select polycarbonate or stainless steel. Delete base material if not required.

* + - 1. Base Material: Polycarbonate.
				1. Deck Base: 9 by 15-1/4 inch (228 by 387 mm).
				2. Pipe Clearance: Adjustable from the factory set maximum height of 9-1/4 inch (235 mm) down to a minimum of 4-1/4 inch (108 mm).
				3. Maximum Load Weight on Base: 335 pounds (152 kg) per pipestand.
			2. Base Material: Stainless steel. (Model 12-Base Strut-8 SS)
				1. Deck Base: 12 by 16 inch (305 by 406 mm).
				2. Pipe Clearance: Adjustable from the factory set maximum height of 9-1/4 inch (235 mm) down to a minimum of 3-1/4 inch (83 mm).
				3. Maximum Load Weight on Base: 524 pounds (238 kg) per pipestand.
			3. Pipe Rest: 12 inch (305 mm) Hot-dipped galvanized steel struts connected with stainless steel all thread to the base.
			4. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			5. If supporting insulated pipe, a shield or saddle shall be used.
			6. Strut clamps may be used to attach components to the support.
		1. 12-Base Strut-12: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:

\*\* NOTE TO SPECIFIER \*\* Select polycarbonate or stainless steel. Delete base material if not required.

* + - 1. Base Material: Polycarbonate.
				1. Deck Base: 9 by 15-1/4 inch (228 by 387 mm).
				2. Pipe Clearance: Adjustable from the factory set maximum height of 13-1/4 inch (337 mm) down to a minimum of 4-1/4 inch (108 mm).
				3. Maximum Load Weight: 335 pounds (152 kg) per pipestand.
			2. Base Material: Stainless steel. (Model 12-Base Strut-12 SS)
				1. Deck Base: 12 by 16 inch (305 by 406 mm).
				2. Pipe Clearance: Adjustable from the factory set maximum height of 13-1/4 inch (337 mm) down to a minimum of 3-1/4 inch (83 mm).
				3. Maximum Load Weight on Base: 524 pounds (238 kg) per pipestand.
			3. Pipe Rest: 12 inch (305 mm) Hot-dipped galvanized steel struts connected with stainless steel all thread to the base.
			4. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			5. If supporting insulated pipe, a shield or saddle shall be used.
			6. Strut clamps may be used to attach components to the support.
		1. 16-Base Strut-8: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 16 by 18 inch (406 by 457 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 9-1/4 inch (235 mm) down to a minimum of 4-3/4 inch (114 mm).
			4. Maximum Load Weight: 578 pounds (262 kg) per pipestand.
			5. Pipe Rest: 16 inch (406 mm) Hot-dipped galvanized steel struts connected with stainless steel all thread to the base.
			6. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			7. If supporting insulated pipe, a shield or saddle shall be used.
			8. Strut clamps may be used to attach components to the support.
		2. 16-Base Strut-12: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 16 by 18 inch (406 by 457 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 13-1/4 inch (337 mm) down to a minimum of 4-3/4 inch (120 mm).
			4. Maximum Load Weight: 578 pounds (262 kg) per pipestand.
			5. Pipe Rest: 16 inch (406 mm) Hot-dipped galvanized steel struts connected with stainless steel all thread to the base.
			6. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			7. If supporting insulated pipe, a shield or saddle shall be used.
			8. Strut clamps may be used to attach components to the support.
		3. 20-Base Strut-4: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 19 by 23 inch (483 by 584 mm).
			3. Pipe Clearance: Fixed 4-1/8 inch (105 mm).
			4. Maximum Load Weight: 960 pounds (435 kg) per pipestand.
			5. Pipe Rest: 20 inch (508 mm) Hot-dipped galvanized steel struts connected with hot-dipped galvanized bolt to the base.
			6. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			7. If supporting insulated pipe, a shield or saddle shall be used.
			8. Strut clamps may be used to attach components to the support.
		4. 20-Base Strut-8 - Elevate: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 19 by 23 inch (483 by 584 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 9-1/2 inch (241 mm) down to a minimum of 5-1/2 inch (140 mm).
			4. Maximum Load Weight: 960 pounds (435 kg) per pipestand.
			5. Pipe Rest: 20 inch (508 mm) Hot-dipped galvanized steel struts connected with stainless steel all thread to the base.
			6. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			7. If supporting insulated pipe, a shield or saddle shall be used.
			8. Strut clamps may be used to attach components to the support.
		5. 20-Base Strut-18 - Elevate: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: 19 by 23 inch (483 by 584 mm).
			3. Pipe Clearance: Adjustable from the factory set maximum height of 19 inch (483 mm) down to a minimum of 5-1/2 inch (140 mm).
			4. Maximum Load Weight: 717 pounds (325 kg) per pipestand.
			5. Pipe Rest: 20 inch (508 mm) Hot-dipped galvanized steel struts connected with stainless steel all thread to the base.
			6. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			7. If supporting insulated pipe, a shield or saddle shall be used.
			8. Strut clamps may be used to attach components to the support.
		6. 24-Base Strut-5: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:
			1. Base Material: Polycarbonates.
			2. Deck Base: Two 7-1/2 by 10 inch (190 by 254 mm) bases.
			3. Pipe Clearance: Adjustable from the factory set maximum height of 6-1/8 inch (156 mm) down to a minimum of 4-1/8 inch (105 mm).
			4. Maximum Allowable Uniform Load: 172.5 pounds per foot (256 kg/m).
			5. Pipe Rest: 24 inch (610 mm) Hot-dipped galvanized steel struts connected with stainless steel all thread to the base.
			6. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			7. If supporting insulated pipe, a shield or saddle shall be used.
			8. Strut clamps may be used to attach components to the support.
		7. 36-Base Strut-5: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: Three 7-1/2 by 10 inch (190 by 254 mm) bases.
			3. Pipe Clearance: Adjustable from the factory set maximum height of 6-1/8 inch (156 mm) down to a minimum of 4-1/8 inch (105 mm).
			4. Maximum Allowable Uniform Load: 172.5 pounds per foot (256 kg/m).
			5. Pipe Rest: 36 inch (914 mm) Hot-dipped galvanized steel struts connected with stainless steel all thread to the base.
			6. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			7. If supporting insulated pipe, a shield or saddle shall be used.
			8. Strut clamps may be used to attach components to the support.
		8. 48-Base Strut-5: Pipe and conduit strut support used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical and electrical equipment with the following properties:
			1. Base Material: Polycarbonate.
			2. Deck Base: Four 7-1/2 by 10 inch (190 by 254 mm) bases.
			3. Pipe Clearance: Adjustable from the factory set maximum height of 6-1/8 inch (156 mm) down to a minimum of 4-1/8 inch (105 mm).
			4. Maximum Allowable Uniform Load: 172.5 pounds per foot (256 kg/m).
			5. Pipe Rest: 48 inch (1219.2 mm) Hot-dipped galvanized steel struts connected with stainless steel all thread to the base.
			6. Spacing: Horizontal support spacing per pipe specification, or horizontal pipe support intervals per the appropriate code or standard. Manufacturer's suggested spacing shall not exceed 10 foot (3 m) centers, as loading permits.
			7. If supporting insulated pipe, a shield or saddle shall be used.
			8. Strut clamps may be used to attach components to the support.

\*\* NOTE TO SPECIFIER \*\* Many projects require the use of custom-designed and engineered support frames, hardware, bases and layouts to properly accommodate the varying types of equipment, conduits, ducting, cable trays and piping, as well as the roof topography specific to your job. Whether mounting HVAC or solar equipment, placing walkways, service platforms ramps or bridges, custom configurations are often required. The MIRO team of in-house design professionals and project managers are dedicated to customizing solutions and are experts in assessing the custom needs and requirements of a job, then finding the best, quickest and most cost-effective ways to meet those needs. Our ability to design, engineer and execute intricate, custom projects has made MIRO Industries the go-to leader in the industry.
\*\* NOTE TO SPECIFIER \*\* Delete if water and steam supports are not required.

* 1. CUSTOM HANGER SUPPORT SERIES

\*\* NOTE TO SPECIFIER \*\* To obtain pricing for the 6H series, fill out the information below or the manufacturer's template. Delete if not required.

* + 1. 6H Model Hanger Support: A versatile custom product able to support a single pipe or multiple pipes at varying heights above the roof for maximum efficiency and cost savings. System is designed for various pipe sizes and configurations. The frame structure consists of two load distributing bases with vertical strut legs and a horizontal strut header. Supports sizes are to be determined for project specific needs and allow for a range of vertical adjustability. Horizontal cross bracing between adjacent frames may be required. Support is to include appropriate hanger type as specified below. Provide rooftop pipe layout drawings for manufacturer’s use and the following:

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

* + - 1. Deck Bases:
				1. Polycarbonate, 9 by 15-1/4 inch (229 by 387 mm).
				2. Stainless steel, 8 by 14 inch (203 by 356 mm).
				3. Hot-dipped galvanized steel, 8 by 14 inch (203 by 356 mm).
			2. Type of Pipe Being Supported: \_\_\_\_\_\_\_\_\_.
			3. Pipe Contents: \_\_\_\_\_\_\_\_\_.
			4. Centerline Distance between Adjacent Pipes for Multiple Pipe Supports: \_\_\_\_\_\_\_\_\_.
			5. Minimum / Maximum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
			6. Pipe Insulation Thickness: \_\_\_\_\_\_\_\_\_.
			7. Total Length of Pipe Run:\_\_\_\_\_\_\_\_\_.
			8. Quantity of Supports Required:\_\_\_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Select hanger type. Indicate material if required. Delete if not required.

* + - 1. Hanger Type:
				1. Clevis hanger.
				2. Roller hanger.
				3. Roller chair.
				4. Trapeze hanger.
			2. If supporting insulated pipe, a shield or saddle shall be used at each hanger location.

\*\* NOTE TO SPECIFIER \*\* To obtain pricing for the 8H series, fill out the information below or the manufacturer's template. Delete if not required.

* + 1. 8H Model Hanger Support: A versatile custom product able to support a single pipe or multiple pipes at varying heights above the roof for maximum efficiency and cost savings. System is designed for various pipe sizes and configurations. The frame structure consists of two load distributing bases with vertical strut legs and a horizontal strut header. Support sizes are to be determined for project specific needs and allow for a range of vertical adjustability. Horizontal cross bracing between adjacent frames may be required. Support is to include appropriate hanger type as specified below. Provide rooftop pipe layout drawings for manufacturer’s use and the following:

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

* + - 1. Deck Bases:
				1. Polycarbonate, 16 by 18 inch (406 by 457 mm).
				2. Stainless steel, 12 by 16 inch (305 by 406 mm).
				3. Hot-dipped galvanized steel, 12 by 16 inch (305 by 406 mm).
			2. Type of Pipe Being Supported: \_\_\_\_\_\_\_\_\_.
			3. Pipe Contents: \_\_\_\_\_\_\_\_\_.
			4. Centerline Distance between Adjacent Pipes for Multiple Pipe Supports: \_\_\_\_\_\_\_\_\_.
			5. Minimum / Maximum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
			6. Pipe Insulation Thickness: \_\_\_\_\_\_\_\_\_.
			7. Total length of Pipe Run:\_\_\_\_\_\_\_\_\_\_.
			8. Quantity of Supports Required:\_\_\_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Select hanger type. Indicate material if required. Delete if not required.

* + - 1. Hanger Type:
				1. Clevis hanger.
				2. Roller hanger.
				3. Roller chair.
				4. Trapeze hanger.
			2. If supporting insulated pipe, a shield or saddle shall be used.

\*\* NOTE TO SPECIFIER \*\* To obtain pricing for the 10H series, fill out the information below or the manufacturer's template. Delete if not required.

* + 1. 10H Model Hanger Support: A versatile custom product able to support a single pipe or multiple pipes at varying heights above the roof for maximum efficiency and cost savings. System is designed for various pipe sizes and configurations. The frame structure consists of two load distributing bases with vertical strut legs and a horizontal strut header. Support sizes are to be determined for project specific needs and allow for a range of vertical adjustability. Horizontal cross bracing between adjacent frames may be required. Support is to include appropriate hanger type as specified below. Provide rooftop pipe layout drawings for manufacturer’s use and the following:

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

* + - 1. Deck Bases: Polycarbonate, 19 by 23 inch (483 by 584 mm).
			2. Type of Pipe Being Supported: \_\_\_\_\_\_\_\_\_.
			3. Pipe Contents: \_\_\_\_\_\_\_\_\_.
			4. Centerline Distance between Adjacent Pipes for Multiple Pipe Supports: \_\_\_\_\_\_\_\_\_.
			5. Minimum / Maximum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
			6. Pipe Insulation Thickness: \_\_\_\_\_\_\_\_\_.
			7. Total length of Pipe Run:\_\_\_\_\_\_\_\_\_\_.
			8. Quantity of Supports Required:\_\_\_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Select hanger type. Indicate material if required. Delete if not required.

* + - 1. Hanger Type:
				1. Clevis hanger.
				2. Roller hanger.
				3. Roller chair.
				4. Trapeze hanger.
			2. If supporting insulated pipe, a shield or saddle shall be used.

\*\* NOTE TO SPECIFIER \*\* To obtain pricing for the 16H series, fill out the information below or the manufacturer's template. Delete if not required.

\*\* NOTE TO SPECIFIER \*\* Stanchioned supports are designed to meet project specific design criteria including applicable lateral wind/seismic loading. Detailed information about the building structure and roof section are required to complete a design compliant with applicable building codes. Lateral wind/seismic loading is determined in accordance with ASCE 7 - "Minimum Design Loads for Buildings and Other Structures” as referenced in most building codes. Delete if not required.

* + 1. Stanchioned Pipe Supports: For rooftop mounted pipe subject to Building Code requirements to meet wind, seismic, snow, tornado, or other forces. The supports from the above hanger categories used with Stanchioned Pipe Supports placed strategically on the roof can provide a code-compliant solution. Project-specific design requirements for rooftop supports can be met through a deferred submittal or delegated design engineering analysis provided by MIRO Industries Engineering Department. Provide rooftop pipe layout drawings for manufacturer’s use and the following:
			1. Type of Pipe Being Supported:\_\_\_\_\_\_\_\_\_\_.
			2. Pipe Contents:\_\_\_\_\_\_\_\_\_\_.
			3. Centerline Distance between Adjacent Pipes for Multiple Pipe Supports:\_\_\_\_\_\_\_\_\_\_.
			4. Minimum/Maximum Clearance Above Roof:\_\_\_\_\_\_\_\_\_\_.
			5. Pipe Insulation Thickness:\_\_\_\_\_\_\_\_\_\_.
			6. Total Length of Pipe Run:\_\_\_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Select structural design criteria. Delete if not required.

* + - 1. Structural Design Criteria in accordance with Structural Documents.
			2. Wind, Seismic and Snow Design Criteria:
				1. Adopted Building Code: \_\_\_\_\_\_\_\_\_\_.
				2. Building Risk/Occupancy Category:\_\_\_\_\_\_\_\_\_\_.
				3. Wind Design Criteria:

Mean Roof Height:\_\_\_\_\_\_\_\_\_\_

Basic Wind Speed:\_\_\_\_\_\_\_\_\_\_ (3 Second Gust).

Exposure Category:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Seismic Design Criteria:

Seismic Design Category:\_\_\_\_\_\_\_\_\_\_

Design Short Period MCE Spectral Response acceleration, SDS:\_\_\_\_\_\_\_\_\_\_

Seismic Component Importance Factor, IE:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Snow Design Criteria:

Rooftop Snow Load, pf:\_\_\_\_\_\_\_\_\_\_

Snow Exposure Factor, Ce:\_\_\_\_\_\_\_\_\_\_

Snow Thermal Factor, Ct:\_\_\_\_\_\_\_\_\_\_

* + - 1. Appliances and supports that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with International Building Code 1609, and ASCE 7 Chapter 29.
			2. When earthquake loads are applicable in accordance with International Building Code 1613, and ASCE 7 Chapter 13, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			3. When snow loads are applicable in accordance with International Building Code 1603 and 1608, and ASCE 7 Chapter 7, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			4. When tornado loads are applicable in accordance with International Building Code 1609, and ASCE 7 Chapter 32, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			5. The design requirements for mechanical/plumbing/electrical components, supports and attachments shall be supported by one of the following methods:
				1. Project-specific design and documentation submitted for approval to the authority having jurisdiction after review and acceptance by a registered design professional.
				2. Submittal of manufacturer's certification that the component is qualified by an independent third party via either analysis or testing in accordance with industry standards.
			6. If supporting insulated pipe, a shield or saddle shall be used.

\*\* NOTE TO SPECIFIER \*\* Delete if duct and cable tray supports are not required.

* 1. CUSTOM DUCT AND CABLE TRAY SUPPORT SERIES

\*\* NOTE TO SPECIFIER \*\* To obtain pricing for the 6DS series, fill out the information below or the manufacturer's template. Delete if not required.

6DS Model Duct and Cable Tray Support: A versatile custom product designed for single or multiple duct supports and cable trays at varying heights above the roof and widths for maximum efficiency and cost savings. System is designed to project specific requirements. The frame structure consists of two load distributing bases with vertical strut legs and a horizontal strut header. Supports are designed with a range of vertical adjustability. Horizontal cross bracing between adjacent frames may be required. Provide rooftop duct layout drawings for manufacturer's use and the following:

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

* + 1. 6DS Model Duct and Cable Tray Support: A versatile custom product designed for single or multiple duct supports and cable trays at varying heights above the roof and widths for maximum efficiency and cost savings. System is designed to project specific needs. The frame structure consists of two load distributing bases with vertical strut legs and a horizontal strut header. Supports are designed with a range of vertical adjustability. Horizontal cross bracing between adjacent frames may be required. Provide rooftop duct layout drawings for manufacturer's use and the following:

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

* + - 1. Deck Bases: Polycarbonate, 9 by 15-1/4 inch (229 by 387 mm).
			2. Deck Bases: Stainless steel, 8 by 14 inch (203 by 356 mm).
			3. Deck Bases: Hot-dipped galvanized steel, 8 by 14 inch (203 by 357 mm).
			4. Duct Dimensions: \_\_\_\_\_\_\_\_\_. (Width by Height)
			5. Duct Material: \_\_\_\_ gauge thickness.
			6. Minimum / Maximum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
			7. Duct Insulation Thickness: \_\_\_\_\_\_\_\_\_ (Exterior Insulation).
			8. Maximum Outside Dimension: \_\_\_\_\_\_\_\_\_ (Width by Height).
			9. Total Length of Duct Run:\_\_\_\_\_\_\_\_\_\_.
			10. Quantity of Supports Required:\_\_\_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete if enclosed frame is not required.

* + - 1. Provide additional header bar to enclose equipment being supported.

\*\* NOTE TO SPECIFIER \*\* To obtain pricing for the 8DS series, fill out the information below or the manufacturer's template. Delete if not required.

* + 1. 8DS Model Duct and Cable Tray Support: A versatile custom product designed for single or multiple duct supports and cable trays at varying heights above the roof and widths for maximum efficiency and cost savings. System is designed to project specific needs. The frame structure consists of two load distributing bases with vertical strut legs and a horizontal strut header. Supports are designed with a range of vertical adjustability. Horizontal cross bracing between adjacent frames may be required. Provide rooftop duct layout drawings for manufacturer's use and the following:

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

* + - 1. Deck Bases: Polycarbonate, 16 by 18 inch (406 by 457 mm).
			2. Deck Bases: Stainless steel, 12 by 16 inch (305 by 406 mm).
			3. Deck Bases: Hot-dipped galvanized steel, 12 by 16 inch (305 by 406 mm).
			4. Duct Dimensions: \_\_\_\_\_\_\_\_\_. (Width by Height)
			5. Duct Material: \_\_\_\_ gauge thickness.
			6. Minimum/Maximum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
			7. Duct Insulation Thickness: \_\_\_\_\_\_\_\_\_ (Exterior Insulation).
			8. Maximum Outside Dimension: \_\_\_\_\_\_\_\_\_ (Width by Height).
			9. Total Length of Duct Run:\_\_\_\_\_\_\_\_\_\_.
			10. Quantity of Supports Required:\_\_\_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER Delete if enclosed frame is not required.

* + - 1. Provide additional header bar to enclose equipment being supported.

\*\* NOTE TO SPECIFIER \*\* To obtain pricing for the 10DS series, fill out the information below or the manufacturer's template. Delete if not required.

* + 1. 10DS Model Duct and Cable Tray Support: A versatile custom product designed for single or multiple duct supports and cable trays at varying heights above the roof and widths for maximum efficiency and cost savings. System is designed to project specific needs. The frame structure consists of two load distributing bases with vertical strut legs and a horizontal strut header. Supports are designed with a range of vertical adjustability. Horizontal cross bracing between adjacent frames may be required. Provide rooftop duct layout drawings for manufacturer's use and the following:
			1. Deck Bases: Polycarbonate, 19 by 23 inch (483 by 584 mm).
			2. Duct Dimensions: \_\_\_\_\_\_\_\_\_ (Width by Height).
			3. Duct Material: \_\_\_\_ gauge thickness.
			4. Minimum / Maximum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
			5. Duct Insulation Thickness: \_\_\_\_\_\_\_\_\_ (External Insulation).
			6. Maximum Outside Dimension: \_\_\_\_\_\_\_\_\_ (Width by Height).
			7. Total Length of Duct Run:\_\_\_\_\_\_\_\_\_\_.
			8. Quantity of Supports Required:\_\_\_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete if enclosed frame is not required.

* + - 1. Provide additional header bar to enclose equipment being supported.

\*\* NOTE TO SPECIFIER \*\* Stanchioned supports are designed to meet project specific design criteria including applicable lateral wind/seismic loading. Detailed information about the building structure and roof section are required to complete a design compliant with applicable building codes. Lateral wind/seismic loading is determined in accordance with ASCE 7 - "Minimum Design Loads for Buildings and Other Structures” as referenced in most building codes. Delete if not required.

* + 1. Stanchioned Duct Supports: For rooftop mounted duct and cable trays subject to Building Code requirements to meet wind, seismic, snow, tornado, or other forces. The supports from the above support categories used with Stanchioned Duct Supports placed strategically on the roof can provide a code-compliant solution. Project-specific design requirements for rooftop supports can be met through a deferred submittal engineering analysis provided by MIRO Industries Engineering Department. Provide rooftop duct and cable tray layout drawings for manufacturer’s use and the following:
			1. Duct Dimensions: \_\_\_\_\_\_\_\_\_ (Width by Height).
			2. Duct Material: \_\_\_\_ gauge thickness.
			3. Minimum / Maximum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
			4. Duct Insulation Thickness: \_\_\_\_\_\_\_\_\_ (Exterior Insulation).
			5. Maximum Outside Dimension: \_\_\_\_\_\_\_\_\_ (Width by Height).
			6. Total Length of Duct Run:\_\_\_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Select structural design criteria. Delete if not required.

* + - 1. Structural Design Criteria in accordance with Structural Documents
			2. Wind, Seismic and Snow Design Criteria:
				1. Adopted Building Code: \_\_\_\_\_\_\_\_\_\_.
				2. Building Risk/Occupancy Category:\_\_\_\_\_\_\_\_\_\_.
				3. Wind Design Criteria:

Mean Roof Height:\_\_\_\_\_\_\_\_\_\_

Basic Wind Speed:\_\_\_\_\_\_\_\_\_\_ (3 Second Gust).

Exposure Category:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Seismic Design Criteria:

Seismic Design Category:\_\_\_\_\_\_\_\_\_\_

Design Short Period MCE Spectral Response acceleration, SDS:\_\_\_\_\_\_\_\_\_\_

Seismic Component Importance Factor, IE:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Snow Design Criteria:

Rooftop Snow Load, pf:\_\_\_\_\_\_\_\_\_\_

Snow Exposure Factor, Ce:\_\_\_\_\_\_\_\_\_\_

Snow Thermal Factor, Ct:\_\_\_\_\_\_\_\_\_\_

* + - 1. Appliances and supports that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with International Building Code 1609, and ASCE 7 Chapter 29.
			2. When earthquake loads are applicable in accordance with International Building Code 1613, and ASCE 7 Chapter 13, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			3. When snow loads are applicable in accordance with International Building Code 1603 and 1608, and ASCE 7 Chapter 7, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			4. When tornado loads are applicable in accordance with International Building Code 1609, and ASCE 7 Chapter 32, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			5. The design requirements for mechanical/plumbing/electrical components, supports and attachments shall be supported by one of the following methods:
				1. Project-specific design and documentation submitted for approval to the authority having jurisdiction after review and acceptance by a registered design professional.
				2. Submittal of manufacturer's certification that the component is qualified by an independent third party via either analysis or testing in accordance with industry standards.
			6. If supporting insulated duct, a shield or saddle shall be used.

\*\* NOTE TO SPECIFIER \*\* Retain below for mechanical unit supports. Delete if mechanical unit supports are not required.

* 1. MECHANICAL SUPPORTS

\*\* NOTE TO SPECIFIER \*\* Standard adjustable height up to 5 inch, even load required, maximum load is 200 pounds. Typical sizes include 24x24x5, 30x30x5, 36x36x5 and 24x48x5. Discuss with manufacturer if other sizes are required. Delete if not required.

* + 1. LD Mechanical Supports: Custom product designed to elevate and support mechanical units, cabinets and other devices allowing the roof environment and mechanical pipe network to expand and contract with temperature changes. Support pan is adjustable in height, designed with slots to allow proper ventilation and moisture drainage, and the following:
			1. Deck Bases: Polycarbonate, four 7-1/2 by 10 inch (191 by 254 mm).
			2. Support Pan: An 11 ga. hot-dip galvanized pan with upturned edges and perforations in the center of the pan for ventilation and drainage.

\*\* NOTE TO SPECIFIER \*\* Select pan size for project conditions Delete if not required.

* + - 1. Pan size and height off the roof:
				1. 20 by 36 inch (508 by 914 mm) at 8 inches (203 mm) above the roof.
				2. 24 by 24 inch (610 by 610 mm) at 8 inches (203 mm) above the roof.
				3. 30 by 30 inch (762 by 762 mm) at 8 inches (203 mm) above the roof.
				4. 36 by 36 inch (914 by 914 mm) at 8 inches (203 mm) above the roof.
			2. Metal Components: Hot-dipped galvanized and stainless steel.
			3. Mechanical Unit Weight: \_\_\_\_\_\_\_\_\_.
		1. 6-HD Mechanical Supports: Custom product designed to elevate and support mechanical units, cabinets and other devices allowing the roof environment and mechanical pipe network to expand and contract with temperature changes. Support is constructed to desired height, width and length, and the following:

\*\* NOTE TO SPECIFIER \*\* Select bases material. Delete if not required. Base size is determined based on required loading.

* + - 1. Deck Bases: Polycarbonate, 9 by 15-1/4 inch (229 by 387 mm).
			2. Deck Bases: Stainless steel, 8 by 14 inch (203 by 356 mm).
			3. Deck Bases: Hot-dipped galvanized steel, 8 by 14 inch (203 by 356 mm).

\*\* NOTE TO SPECIFIER \*\* Select platform type based on project conditions. Delete if not required.

* + - 1. Platforms: 12 inch (305 mm) Punched Interlock Grating with anti-skid surface.
				1. Platform Width: \_\_\_\_\_\_\_\_\_.
				2. Platform Length: \_\_\_\_\_\_\_\_\_.
				3. Minimum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
				4. Mechanical Unit Weight: \_\_\_\_\_\_\_\_\_.
			2. Platforms: Bar grating.
				1. Platform Width: \_\_\_\_\_\_\_\_\_.
				2. Platform Length: \_\_\_\_\_\_\_\_\_.
				3. Minimum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
				4. Mechanical Unit Weight: \_\_\_\_\_\_\_\_\_.
			3. Rail style support: 1-5/8 inch (41 mm) strut rails.
				1. Unit Width: \_\_\_\_\_\_\_\_\_.
				2. Unit Length: \_\_\_\_\_\_\_\_\_.
				3. Minimum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
				4. Mechanical Unit Weight: \_\_\_\_\_\_\_\_\_.
		1. 8-HD Mechanical Supports: Custom product designed to elevate and support mechanical units, cabinets and other devices allowing the roof environment and mechanical pipe network to expand and contract with temperature changes. Support is constructed to desired height, width and length, and the following:

\*\* NOTE TO SPECIFIER \*\* Select bases material. Delete if not required. Base size is determined based on required loading.

* + - 1. Deck Bases: Polycarbonate, 16 by 18 inch (406 by 457 mm).
			2. Deck Bases: Stainless steel, 12 by 16 inch (305 by 406 mm).
			3. Deck Bases: Hot-dipped galvanized steel, 12 by 16 inch (305 by 406 mm).

\*\* NOTE TO SPECIFIER \*\* Select platform type based on project conditions. Delete if not required.

* + - 1. Platforms: 12 inch (305 mm) Punched Interlock Grating with anti-skid surface.
				1. Platform Width: \_\_\_\_\_\_\_\_\_.
				2. Platform Length: \_\_\_\_\_\_\_\_\_.
				3. Minimum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
				4. Mechanical Unit Weight: \_\_\_\_\_\_\_\_\_.
			2. Platforms: Bar grating.
				1. Platform Width: \_\_\_\_\_\_\_\_\_.
				2. Platform Length: \_\_\_\_\_\_\_\_\_.
				3. Minimum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
				4. Mechanical Unit Weight: \_\_\_\_\_\_\_\_\_.
			3. Rail style support: 1-5/8 inch (41 mm) strut rails.
				1. Unit Width: \_\_\_\_\_\_\_\_\_.
				2. Unit Length: \_\_\_\_\_\_\_\_\_.
				3. Minimum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
				4. Mechanical Unit Weight: \_\_\_\_\_\_\_\_\_

\*\* NOTE TO SPECIFIER \*\* Stanchioned mechanical supports are designed to meet project specific design criteria including applicable lateral wind/seismic loading. Detailed information about the building structure and roof section are required to complete a design compliant with applicable building codes. Lateral wind/seismic loading is determined in accordance with ASCE 7 - "Minimum Design Loads for Buildings and Other Structures” as referenced in most building codes. Delete if not required.

* + 1. Stanchioned Mechanical Unit Support: For rooftop mounted mechanical units subject to Building Code requirements to meet wind, seismic, snow, tornado, or other forces. The Stanchioned Mechanical Unit Supports placed strategically on the roof can provide a code-compliant solution. Project-specific design requirements for rooftop supports can be met through a deferred submittal engineering analysis provided by MIRO Industries Engineering Department. Provide rooftop mechanical unit layout drawings for manufacturer’s use and the following:
			1. Minimum/Maximum Clearance Above Roof: \_\_\_\_\_\_\_\_\_.
			2. Mechanical Unit Dimensions: \_\_\_\_\_ long by \_\_\_\_\_wide by \_\_\_\_\_ high.
			3. Mechanical Unit Weight: \_\_\_\_\_\_\_\_\_.
			4. Mechanical Unit Attachment Points: width\_\_\_\_\_\_\_\_length\_\_\_\_\_\_\_\_

\*\* NOTE TO SPECIFIER \*\* Select structural design criteria. Delete if not required.

* + - 1. Structural Design Criteria in accordance with Structural Documents
			2. Wind, Seismic and Snow Design Criteria:
				1. Adopted Building Code: \_\_\_\_\_\_\_\_\_\_.
				2. Building Risk/Occupancy Category:\_\_\_\_\_\_\_\_\_\_.
				3. Wind Design Criteria:

Mean Roof Height:\_\_\_\_\_\_\_\_\_\_

Basic Wind Speed:\_\_\_\_\_\_\_\_\_\_ (3 Second Gust).

Exposure Category:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Seismic Design Criteria:

Seismic Design Category:\_\_\_\_\_\_\_\_\_\_

Design Short Period MCE Spectral Response acceleration, SDS:\_\_\_\_\_\_\_\_\_\_

Seismic Component Importance Factor, IE:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Snow Design Criteria:

Rooftop Snow Load, pf:\_\_\_\_\_\_\_\_\_\_

Snow Exposure Factor, Ce:\_\_\_\_\_\_\_\_\_\_

Snow Thermal Factor, Ct:\_\_\_\_\_\_\_\_\_\_

* + - 1. Appliances and supports that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with International Building Code 1609, and ASCE 7 Chapter 29.
			2. When earthquake loads are applicable in accordance with International Building Code 1613, and ASCE 7 Chapter 13, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			3. When snow loads are applicable in accordance with International Building Code 1603 and 1608, and ASCE 7 Chapter 7, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			4. When tornado loads are applicable in accordance with International Building Code 1609, and ASCE 7 Chapter 32, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			5. The design requirements for mechanical/plumbing/electrical components, supports and attachments shall be supported by one of the following methods:
				1. Project-specific design and documentation submitted for approval to the authority having jurisdiction after review and acceptance by a registered design professional.
				2. Submittal of manufacturer's certification that the component is qualified by an independent third party via either analysis or testing in accordance with industry standards.

\*\* NOTE TO SPECIFIER \*\* Retain below for Crossover Bridges. Delete if not required.

* 1. SUREFOOT ACCESS PRODUCTS

\*\* NOTE TO SPECIFIER \*\* Built to offer safe and cost effective access to facilities and equipment, Surefoot Access Products are custom-designed to meet ICC and OSHA standards for maintenance access. They are shipped partially assembled and ready for easy on-site assembly. Surefoot Bridge Crossovers span across pipes, ducts, expansion joints, elevations changes and other potential obstructions with an engineered stair access. Surefoot ramps offer solutions for wheeled access to areas previously blocked by obstructions thus allowing for equipment to be wheeled across the roof. Surefoot service platforms offer secure, elevated access to equipment in almost any setting. All Surefoot Access items are specifically designed for rooftop applications. Molded polycarbonate bases effectively distribute loading to prevent ponding or other damage to the roof surface and other critical rooftop equipment. Slip resistant bar grating or interlock planning are used on all walking surfaces to ensure solid footing and minimize snow and ice accumulation. Surefoot Access product metal components are all made of 100% galvanized materials to resist corrosion.

* + 1. Crossover Bridges: Custom designed stairways made to crossover roof pipes, ducts, cable trays, expansion joints, parapet walls, elevation changes, and other obstructions. Crossovers are to meet project specific requirements and OSHA 1910 Subpart D standards for the build requirements, including guardrail system requirements at heights greater than 48 inches, and the following:
			1. Clearance Height Required: \_\_\_\_\_\_\_\_\_\_.
			2. Clearance Length Required: \_\_\_\_\_\_\_\_\_\_.
			3. Crossover Width Required: \_\_\_\_\_\_\_\_\_\_ (22 inches (559 mm) minimum).

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

* + - 1. Deck Bases: Polycarbonate, 16 by 18 inch (406 by 457 mm).
			2. Deck Bases: Stainless steel, 12 by 16 inch (305 by 406 mm).
			3. Deck Bases: Hot-dipped galvanized steel, 12 by 16 inch (305 by 406 mm).

\*\* NOTE TO SPECIFIER \*\* Select metal type based on project conditions. Delete if not required.

* + - 1. Metal Components: Hot-dipped galvanized steel.
			2. Metal Components: Stainless steel.
			3. Walking Surfaces: 12 inch (305 mm) Punched Interlock Grating with anti-skid surface.
			4. Walking Surfaces: Bar Grating with serrated surface.
			5. Walking Surfaces: Fiberglass Grating.
			6. Railings: Standard railings shall be provided on all stairways having 4 or more risers and platforms 4 feet (1.22 m) or more above adjacent level.
			7. Toeboards: 4 inch (102 mm) Toeboards shall be provided whenever, beneath the open side:
				1. A person can pass;
				2. There is moving machinery;
				3. Where falling material could create a hazard.

\*\* NOTE TO SPECIFIER \*\* Select structural design criteria. Stanchioned crossover systems are designed to meet project specific design criteria. Detailed information about the building structure and roof section are required to complete a design compliant with the International Codes and ASCE 7 - "Minimum Design Loads for Buildings and Other Structures. Delete if not required.

* + - 1. Structural Design Criteria in accordance with Structural Documents
			2. Wind, Seismic and Snow Design Criteria:
				1. Adopted Building Code: \_\_\_\_\_\_\_\_\_\_.
				2. Building Risk/Occupancy Category:\_\_\_\_\_\_\_\_\_\_.
				3. Wind Design Criteria:

Mean Roof Height:\_\_\_\_\_\_\_\_\_\_

Basic Wind Speed:\_\_\_\_\_\_\_\_\_\_ (3 Second Gust).

Exposure Category:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Seismic Design Criteria:

Seismic Design Category:\_\_\_\_\_\_\_\_\_\_

Design Short Period MCE Spectral Response acceleration, SDS:\_\_\_\_\_\_\_\_\_\_

Seismic Component Importance Factor, IE:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Snow Design Criteria:

Rooftop Snow Load, pf:\_\_\_\_\_\_\_\_\_\_

Snow Exposure Factor, Ce:\_\_\_\_\_\_\_\_\_\_

Snow Thermal Factor, Ct:\_\_\_\_\_\_\_\_\_\_

* + - 1. Appliances and supports that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with International Building Code 1609, and ASCE 7 Chapter 29.
			2. When earthquake loads are applicable in accordance with International Building Code 1613, and ASCE 7 Chapter 13, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			3. When snow loads are applicable in accordance with International Building Code 1603 and 1608, and ASCE 7 Chapter 7, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			4. When tornado loads are applicable in accordance with International Building Code 1609, and ASCE 7 Chapter 32, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			5. The design requirements for crossovers, supports, and attachments shall be supported by one of the following methods:
				1. Project-specific design and documentation submitted for approval to the authority having jurisdiction after review and acceptance by a registered design professional.
				2. Submittal of manufacturer's certification that the component is qualified by an independent third party via either analysis or testing in accordance with industry standards.

\*\* NOTE TO SPECIFIER \*\* Retain below for Crossover Ramps. Delete if not required.

* + 1. Crossover Ramps: Custom designed ramps made to crossover roof pipes, ducts, cable trays, expansion joints, and other obstructions and easy transportation of equipment. Ramps are to meet project specific requirements and OSHA 1910 Subpart D standards for the build requirements, including guardrail system requirements at heights greater than 48 inches, and the following:
			1. Clearance Height Required: \_\_\_\_\_\_\_\_\_\_.
			2. Clearance Length Required: \_\_\_\_\_\_\_\_\_\_.
			3. Ramp Width Required: \_\_\_\_\_\_\_\_\_\_ (22 inch (559 mm) minimum.)

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

* + - 1. Deck Bases: Polycarbonate, 16 by 18 inch (406 by 457 mm).
			2. Deck Bases: Stainless steel, 12 by 16 inch (305 by 406 mm).
			3. Deck Bases: Hot-dipped galvanized steel, 12 by 16 inch (305 by 406 mm).

\*\* NOTE TO SPECIFIER \*\* Select metal type based on project conditions. Delete if not required.

* + - 1. Metal Components: Hot-dipped galvanized steel.
			2. Metal Components: Stainless steel.
			3. Walking Surfaces: 12 inch (305 mm) Punched Interlock Grating with anti-skid surface.
			4. Walking Surfaces: Bar grating with serrated surface.
			5. Walking Surfaces: Fiberglass Grating

\*\* NOTE TO SPECIFIER \*\* Retain below if railings are to be provided. Delete if railings are not required.

* + - 1. Railings: Standard railings shall be provided on all ramps and platforms 4 feet (1.22 m) or more above adjacent level.
			2. Toeboards: 4 inch (102 mm) Toeboards shall be provided whenever, beneath the open side:
				1. A person can pass;
				2. There is moving machinery;
				3. Where falling material could create a hazard.

\*\* NOTE TO SPECIFIER \*\* \*\* Select structural design criteria. Stanchioned ramp systems are designed to meet project specific design criteria. Detailed information about the building structure and roof section are required to complete a design compliant with the International Codes and ASCE 7 - "Minimum Design Loads for Buildings and Other Structures. Delete if not required.

* + - 1. Structural Design Criteria in accordance with Structural Documents
			2. Wind, Seismic and Snow Design Criteria:
				1. Adopted Building Code: \_\_\_\_\_\_\_\_\_\_.
				2. Building Risk/Occupancy Category:\_\_\_\_\_\_\_\_\_\_.
				3. Wind Design Criteria:

Mean Roof Height:\_\_\_\_\_\_\_\_\_\_

Basic Wind Speed:\_\_\_\_\_\_\_\_\_\_ (3 Second Gust).

Exposure Category:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Seismic Design Criteria:

Seismic Design Category:\_\_\_\_\_\_\_\_\_\_

Design Short Period MCE Spectral Response acceleration, SDS:\_\_\_\_\_\_\_\_\_\_

Seismic Component Importance Factor, IE:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Snow Design Criteria:

Rooftop Snow Load, pf:\_\_\_\_\_\_\_\_\_\_

Snow Exposure Factor, Ce:\_\_\_\_\_\_\_\_\_\_

Snow Thermal Factor, Ct:\_\_\_\_\_\_\_\_\_\_

* + - 1. Appliances and supports that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with International Building Code 1609, and ASCE 7 Chapter 29.
			2. When earthquake loads are applicable in accordance with International Building Code 1613, and ASCE 7 Chapter 13, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			3. When snow loads are applicable in accordance with International Building Code 1603 and 1608, and ASCE 7 Chapter 7, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			4. When tornado loads are applicable in accordance with International Building Code 1609, and ASCE 7 Chapter 32, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			5. The design requirements for ramps, supports, and attachments shall be supported by one of the following methods:
				1. Project-specific design and documentation submitted for approval to the authority having jurisdiction after review and acceptance by a registered design professional.
				2. Submittal of manufacturer's certification that the component is qualified by an independent third party via either analysis or testing in accordance with industry standards.

\*\* NOTE TO SPECIFIER \*\* Retain below for Service Platforms. Delete if not required.

* + 1. Service Platforms: Custom-designed platforms made to access elevated rooftop equipment. Platforms are to meet project specific requirements and OSHA 1910 Subpart D standards for the build requirements, including guardrail system requirements at heights greater than 48 inches, and the following:
			1. Clearance Height Required: \_\_\_\_\_\_\_\_\_\_.
			2. Required Length of Platform: \_\_\_\_\_\_\_\_\_\_.
			3. Required Width of Platform: \_\_\_\_\_\_\_\_\_\_.

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

* + - 1. Deck Bases: Polycarbonate, 16 by 18 inch (406 by 457 mm).
			2. Deck Bases: Stainless steel, 12 by 16 inch (3058 by 406 mm).
			3. Deck Bases: Hot-dipped galvanized steel, 12 by 16 inch (305 by 406 mm).

\*\* NOTE TO SPECIFIER \*\* Select metal type based on project conditions. Delete if not required.

* + - 1. Metal Components: Hot-dipped galvanized steel.
			2. Metal Components: Stainless steel.
			3. Walking Surfaces: 12 inch (305 mm) Punched Interlock Grating with anti-skid surface.
			4. Walking Surfaces: Bar grating with serrated surface.
			5. Walking Surfaces: Fiberglass Grating.

\*\* NOTE TO SPECIFIER \*\* Retain below if railings are to be provided. Delete if railings are not required.

* + - 1. Railings: Standard railings shall be provided on all ramps and platforms 4 feet (1.22 m) or more above adjacent level.
			2. Toeboards: 4 inch (102 mm) Toeboards shall be provided whenever, beneath the open side:
				1. A person can pass;
				2. There is moving machinery;
				3. Where falling material could create a hazard.

\*\* NOTE TO SPECIFIER \*\* Select structural design criteria. Stanchioned service platforms are designed to meet project specific design criteria. Detailed information about the building structure and roof section are required to complete a design compliant with the International Codes and ASCE 7 - "Minimum Design Loads for Buildings and Other Structures. Delete if not required.

* + - 1. Structural Design Criteria in accordance with Structural Documents
			2. Wind, Seismic and Snow Design Criteria:
				1. Adopted Building Code: \_\_\_\_\_\_\_\_\_\_.
				2. Building Risk/Occupancy Category:\_\_\_\_\_\_\_\_\_\_.
				3. Wind Design Criteria:

Mean Roof Height:\_\_\_\_\_\_\_\_\_\_

Basic Wind Speed:\_\_\_\_\_\_\_\_\_\_ (3 Second Gust).

Exposure Category:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Seismic Design Criteria:

Seismic Design Category:\_\_\_\_\_\_\_\_\_\_

Design Short Period MCE Spectral Response acceleration, SDS:\_\_\_\_\_\_\_\_\_\_

Seismic Component Importance Factor, IE:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Snow Design Criteria:

Rooftop Snow Load, pf:\_\_\_\_\_\_\_\_\_\_

Snow Exposure Factor, Ce:\_\_\_\_\_\_\_\_\_\_

Snow Thermal Factor, Ct:\_\_\_\_\_\_\_\_\_\_

* + - 1. Appliances and supports that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with International Building Code 1609, and ASCE 7 Chapter 29.
			2. When earthquake loads are applicable in accordance with International Building Code 1613, and ASCE 7 Chapter 13, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			3. When snow loads are applicable in accordance with International Building Code 1603 and 1608, and ASCE 7 Chapter 7, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			4. When tornado loads are applicable in accordance with International Building Code 1609, and ASCE 7 Chapter 32, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
			5. The design requirements for ramps, supports, and attachments shall be supported by one of the following methods:
				1. Project-specific design and documentation submitted for approval to the authority having jurisdiction after review and acceptance by a registered design professional.
				2. Submittal of manufacturer's certification that the component is qualified by an independent third party via either analysis or testing in accordance with industry standards.
	1. SPECIALTY ENGINEERED PRODUCTS

\*\* NOTE TO SPECIFIER \*\* Select accessories to be provided. Delete accessories not required.

* + 1. Engineered Rooftop Supports: For rooftop mounted components subject to Building Code requirements to meet wind, seismic, snow, tornado, or other forces. Specialty Engineered Products, considered as Stanchioned or Engineered Rooftop Supports, are to be placed strategically on the roof and provide a code-compliant solution. Project-specific design requirements for rooftop supports can be met through a deferred submittal or delegated design engineering analysis provided by MIRO Industries, Inc.
			1. Provide the following items to MIRO Industries to perform an engineering analysis:
				1. Project name and location
				2. Scope
				3. Structural plans including roof deck construction
				4. Roof details including maximum insulation thickness and membrane type
				5. Roof layout including all plans and locations of rooftop components
				6. Specifications
				7. Equipment details including component sizes, material types, insulation, height off roof, etc.
				8. Building height
				9. Any structural limitations or constraints
				10. Any other constraints, considerations, or special instructions
				11. Structural notes including the Project Specific Design Criteria:

\*\* NOTE TO SPECIFIER \*\* Select structural design criteria. Delete if not required.

* + - * 1. Adopted Building Code: \_\_\_\_\_\_\_\_\_\_.
				2. Building Risk/Occupancy Category:\_\_\_\_\_\_\_\_\_\_.
				3. Wind Design Criteria:

Mean Roof Height:\_\_\_\_\_\_\_\_\_\_

Basic Wind Speed:\_\_\_\_\_\_\_\_\_\_ (3 Second Gust).

Exposure Category:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Seismic Design Criteria:

Seismic Design Category:\_\_\_\_\_\_\_\_\_\_

Design Short Period MCE Spectral Response acceleration, SDS:\_\_\_\_\_\_\_\_\_\_

Seismic Component Importance Factor, IE:\_\_\_\_\_\_\_\_\_\_

* + - * 1. Snow Design Criteria:

Rooftop Snow Load, pf:\_\_\_\_\_\_\_\_\_\_

Snow Exposure Factor, Ce:\_\_\_\_\_\_\_\_\_\_

Snow Thermal Factor, Ct:\_\_\_\_\_\_\_\_\_\_

* + - 1. Engineered Rooftop Support Products Loading and Design Constraints:
				1. Appliances and supports that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with International Building Code 1609, and ASCE 7 Chapter 29.
				2. When earthquake loads are applicable in accordance with International Building Code 1613, and ASCE 7 Chapter 13, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
				3. When snow loads are applicable in accordance with International Building Code 1603 and 1608, and ASCE 7 Chapter 7, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
				4. When tornado loads are applicable in accordance with International Building Code 1609, and ASCE 7 Chapter 32, mechanical, plumbing, and electrical systems and supports shall be designed and installed accordingly.
				5. Maximum spacing allowed by component type and structural attachment requirements by component type to be based on the following codes and standards:

International Mechanical Code, Section 305

International Fuel and Gas Code, Section 407, 415

International Plumbing Code Section, 308

SMACNA HVAC Duct Construction Standards, Metal and Flexible, Section 4.2

NFPA 70 (NEC) Section 342, 352

Any other codes and standards not previously mentioned, including local building codes and standards, to support specific components as required to meet project specific requirements.

* + - * 1. The design requirements for mechanical/plumbing/electrical components, supports and attachments shall be supported by one of the following methods:

Project-specific design and documentation submitted for approval to the authority having jurisdiction after review and acceptance by a registered design professional.

Submittal of manufacturer's certification that the component is qualified by an independent third party via either analysis or testing in accordance with industry standards.

* + - * 1. Design values are based on rooftop applications only. For other applications contact MIRO Industries for allowable loading.
				2. Maximum loading from any type of MIRO base to finished roof surface not to exceed 3.0 psi (0.021 Mpa) for dead loads, 5.0 psi (0.034 Mpa) for short duration dead combined with live loads, or otherwise specifically indicated in project specifications.
				3. Horizontal deflection does not exceed the span length divided by 240 (*l/240)* or 1/4 inch (6.35 mm).
			1. Engineered Supports Deferred Submittals and Delegated Designs:
				1. To meet documentation requirements per IBC [A] 107.3.4, MIRO Industries is to provide a rooftop support deferred submittals that meet the project specific requirements and show the product has been designed and meets project specific design criteria with the following:

Calculations showing the IBC and ASCE 7 loading and how it is applied to the frames.

Drawings showing how the frames are to be built, materials and finishes used, and connection details back to the structure.

Roof layouts dictating where frames are intended to be installed to support the rooftop components.

* + - * 1. These documents are to be stamped by a licensed registered professional in the jurisdiction.

In addition to the loads shown in the design load schedule, MIRO Industries rooftop equipment supports shall design for the weight of all mechanical, plumbing and electrical equipment and fixtures being supported.

* + - * 1. These documents are to be submitted to the owner and their consultants to review and approve prior to commencement of fabrication.

The general contractor is responsible for coordinating the design and submission of the signed and sealed design for the rooftop equipment supports provided by MIRO Industries, Inc. It is the general contractor's responsibility to assure that all submittals are provided in a timely manner to allow for review and resubmission as required. All rooftop equipment supports shall be designed for the appropriate and applicable loads including uplift and lateral loads.

* + - * 1. General contractor to include in their bid the cost of the noted MIRO Industries products and design submittals.

MIRO Industries rooftop accessory products include, but shall not be limited to, miscellaneous metals including stair crossover systems, service platforms, ramps, mechanical equipment supports, frames and components that support machines, pipes, ductwork, or other rooftop distribution systems.

* + - 1. Additions and Renovations Related to Specialty Engineered Products
				1. All existing conditions, dimensions, locations and elevations of existing and new work, exposed or concealed, shall be verified by the general contractor in the field and coordinated with the new construction prior to preparation of working, shop drawings or fabrication and commencement of any work. If discrepancies are discovered between existing conditions and contract work, the general contractor shall immediately notify the architect or engineer prior to performance of any work.
				2. Prior to shop drawing preparation, the general contractor is to investigate and verify actual field conditions, exposed or concealed and take into account any possible construction interferences and relocations of, but not limited to structures, equipment, utilities, cables, duct lines, piping, drain lines, etc.
				3. Any portion of existing structure adjacent to the construction shall be restored by the contractor to a condition as good as before the commencement of the work at no additional cost to the owner.
				4. Existing structure shall be protected, maintained and supported during the construction work.
	1. ACCESSORIES

\*\* NOTE TO SPECIFIER \*\* Select accessories to be provided. Delete accessories not required.

* + 1. Fitted Support Pads: Designed specifically to fit non-penetrating rooftop supports for additional protection of the rooftop envelope. Slip resistant pads are heat molded with a small lip to hold the support pad and reduce movement on the rooftop. Holes in the pad save weight and allow for venting and drainage.
			1. Support Pad Material: 100 percent recycled rubber.

\*\* NOTE TO SPECIFIER \*\* Select size. Delete sizes not required.

* + - 1. Dimensions: Fitted 19 by 23 inch (483 by 584 mm).
			2. Dimensions: Fitted 16 by 18 inch (406 by 457 mm).
			3. Dimensions: Fitted 9 by 15 inch (230 by 381 mm).
			4. Dimensions: Fitted 7 by 10 inch (178 by 254 mm).
			5. Dimensions: 12 by 12 inch (304.8 by 305 mm).
			6. Dimensions: Custom size as recommended by the manufacturer.
		1. Flat Support Pads: Designed specifically to fit non-penetrating rooftop supports for additional protection of the rooftop envelope. Slip resistant pads are heat molded.
			1. Support Pad Material: 100 percent recycled rubber.

\*\* NOTE TO SPECIFIER \*\* Select size. Delete sizes not required.

* + - 1. Dimensions: 12 by 12 inch (305 by 305 mm).
			2. Dimensions: Custom size as recommended by the manufacturer.
		1. Pipe Guides: Designed to attach to pipe supports to allow pipe to be installed or removed from pipe stands. Pipe guides ship separately for site installation, allowing room for expansion and contraction as recommended by the manufacturer.

\*\* NOTE TO SPECIFIER \*\* Select size. Delete sizes not required.

* + - 1. Size: 1.5.
			2. Size: 3.0.
			3. Size: 3-R-2.
			4. Size: 3-R-4.
			5. Size: 3-RAH-3.
			6. Size: 4-RAH-4.
			7. Size: 5-RAH-5.
			8. Size: 6-RAH-6.
			9. Size: 10-RAH-10
			10. Size: Additional custom sizes per job specific requirements.
		1. Spacers: Polycarbonate structure with gently rounded base, drainage holes and alignment pins that attached to other components to increase height.

\*\* NOTE TO SPECIFIER \*\* Select size. Delete sizes not required.

* + - 1. Size: 3-R.
		1. 3-R Riser Brackets (Pairs): Designed to be inserted into Model 3-R-2 to raise the roller height clearance by 2 inches (51 mm). Sold as a pair to be inserted into 3-R-2 roof supports.

\*\* NOTE TO SPECIFIER \*\* Select factory or field installation. Delete if not required.

* + - 1. Installation: Field installed.
			2. Installation: Factory installed in the 3-R-4 support.
		1. Rollers: Heavy duty support roller of polycarbonate resin.

\*\* NOTE TO SPECIFIER \*\* Select size. Delete sizes not required.

* + - 1. Size: 3 inch (76 mm).
			2. Size: 5 inch (127 mm).
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.
		3. Field Measurements and Quantity Take Off: A manufacturer certified technician shall perform on-site field measurements, coordinate design and layout, designate and tag products based on project conditions.
	2. PREPARATION
		1. Clean roofing surfaces in accordance with the roofing manufacturer's instructions prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for each substrate under the project conditions.
			1. For ballasted or built-up roofs, all loose aggregate shall be removed from an area 2 inch (51 mm) outside each base and support pad footprint.
	3. INSTALLATION
		1. MIRO supports shall be installed as per the product specifications and or project specific submittals.
		2. Install an additional sheet of roofing material, a support pad, or a deck plate beneath the base of each stand.
		3. Place the supports:
			1. Center each stand beneath the component so supports are aligned.
			2. If more than one pipe is being supported, adjust for even-weight distribution.
			3. Set components in or on support without dropping or causing undue impact.
		4. Adjustable Supports: Adjust height of each support to achieve proper height and level before installing supported item.
			1. Level hangers, rollers or struts before installing component.
			2. Make final height adjustments to provide even distribution of load on all supports.
		5. Fixed Anchor Stanchion Supports: Prior to installation of roof decking, insulation, and roof membrane, attach support to roof structure as indicated on submittal drawings.
			1. After installation of roof decking, insulation, and membrane, proceed to install pipe, duct, crossover, ramps, platforms, mechanical supports or other components used in conjunction with fixed anchor supports.
			2. Install remainder of piping, duct, or other rooftop equipment on each support.
	4. FIELD QUALITY CONTROL
		1. When requested by Architect or Engineer, provide a factory-trained representative of manufacturer to visit site while work is in progress to assure that installation complies with design requirements and manufacturer's installation requirements.
		2. After system startup, correct any deficiencies that arise, including but not limited to, improper location or position, improper seating or level on the roof, lack of roof pads or deck plates, inadequate operation, and as directed by Architect or Engineer.
	5. PROTECTION
		1. Protect installed products until completion of project.
		2. Touch-up, repair or replace damaged products before Substantial Completion.
	6. MAINTENANCE
		1. Conduct regular inspections at yearly intervals, per manufacturer's guidelines, or as specified in the project’s maintenance schedule.
		2. Perform a visual inspection of the rooftop supports, nuts, bolts, and associated hardware to identify any signs of damage, wear, or corrosion.
		3. Replace any damaged, corroded, or stripped nuts and bolts with new, manufacturer-approved fasteners. Use fasteners of the same size, grade, and material as specified by the manufacturer for the original installation. Ensure all replacements parts are tightened to the manufacturer’s torque specifications.
		4. Check for any misalignment, unequal loading, loose fasteners, or compromised supports. If misalignment or instability is observed, realign the rooftop support system according to the original design parameters. Ensure that the system is level, stable, and securely fastened.
		5. Inspect surrounding areas for any environmental factors that could affect the rooftop support system, such as water pooling, debris, or excessive wear. Special attention should be given to areas exposed to harsh environmental conditions, such as coastal areas, where corrosion and wear are more prevalent.
		6. Maintenance work shall be conducted in accordance with the manufacturer’s recommendations and any applicable local codes or standards.
		7. Submit a report to the building owner or facilities manager after each inspection, outlining the condition of the rooftop supports, nuts and bolts, and any corrective actions taken.
		8. Any damage caused by improper maintenance or failure to follow recommended procedures may void warranties for the rooftop support system.

END OF SECTION