



SECTION 07 70 00  
ROOF ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. 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. Accessories.

1.2 RELATED SECTIONS

- A. Section 05 50 00 - Metal Fabrications.
- B. Division 07 - Thermal and Moisture Protection.
- C. Section 07 72 40 - Rooftop Walkways.
- D. Section 07 72 55 - Rooftop Pipe Support Systems
- E. Section 21 05 29 - Hangers and Supports for Fire Suppression Pipe.
- F. Section 22 05 29 - Hangers and Supports for Plumbing Pipe and Equipment.
- G. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.
- H. Section 26 05 29 - Hangers and Supports for Electrical Systems

1.3 REFERENCES

- A. 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 D1929 - Standard Test Method for Determining Ignition Temperature of

Plastics.

- B. 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.
- C. American Iron and Steel Institute (AISI):
  - 1. AISI Specifications for the Design of Cold-Formed Steel Structural Members, 2007 Edition.
- D. American Institute of Steel Construction (AISC):
  - 1. Steel Construction Manual, 14th Edition.
- E. American Society of Civil Engineers (ASCE):
  - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- F. International Code Council (ICC):
  - 1. International Building Code.
  - 2. International Mechanical Code.
  - 3. International Fuel and Gas Code.
- G. Occupational Safety and Health Administration (OSHA):
  - 1. Safety and Health Regulations for Construction, Fall Protection.
  - 2. OSHA 1910, Subpart D, Walking and Working Surfaces.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings:
  - 1. Provide project specific, engineered stamped shop drawings and calculations including extents of installation, load bearing capacity and structural requirements.
  - 2. Show installation layout, indicating product type and spacing. Coordinate with manufacturer's take off evaluations, measurements, control dimensions, and rooftop requirements analysis.
  - 3. Show details of each roofing system including material layers and thicknesses, flashing, terminations, and penetrations with each rooftop support system to be installed.
  - 4. All supports shall be pre-assembled and shipped for turnkey installation. Indicate all steps and preparation required by others.
- D. Verification Samples: Provide two full size units for each product to be installed.
- E. 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.

## 1.5 QUALITY ASSURANCE

- A. 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:
    - a. Project concept development and consulting.
    - b. Design and engineering including quantity and type of supports and accessories.
    - c. Fabrication and delivery.
    - d. On site evaluation that installation meets specifications herein and manufacturer requirements.
    - e. Owner training and maintenance instruction.
- B. Installer Qualifications: Approved by the manufacturer, with minimum 5 years of experience installing similar products.
- C. 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.
  3. Refinish mock-up area as required to produce acceptable work.

## 1.6 PRE-INSTALLATION MEETINGS

- A. After approval of submittals, but before beginning installation, conduct a meeting at the Project site including:
  1. Attendance shall include the Architect, 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.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. 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.
- B. Store materials off the ground under ventilated covers until ready for installation.
- C. Handle materials to avoid damage.

## 1.8 PROJECT CONDITIONS

- A. Quantity Take Off: A manufacturer certified technician shall perform on-site quantity take-off including the following:
  - 1. Field measurements.
    - a. 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.
- B. Do not install products under environmental conditions outside manufacturer's recommended limits.
- C. Coordinate with roofing, mechanical, electrical and other related trades as required.

## 1.9 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

## 1.10 WARRANTY

- A. 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.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. 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](mailto:sales@miroind.com); Web: [www.miroind.com](http://www.miroind.com)
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

### 2.2 GENERAL

- A. Unique design absorbs thermal expansion and contraction of pipes 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.
- B. Loading and Design Constraints:
  - 1. Design values are based on rooftop applications only. For other applications contact manufacture 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) unless specifically indicated in project specifications.
  - 3. Horizontal deflection not to exceed the span length divided by 360 (1/360) or 1/8 inch (3.175 mm).

- C. Include manufacturers pipe guides, spacers, clamps, support pads, 2-sided tape and other recommended accessories.

## 2.3 PILLOW BLOCK PIPE SUPPORTS

- A. 1.5 - Pillow Block: Pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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). Each 1.5 spacer increases the clearance of the pipe by 1-1/2 inches (38 mm).
  - 4. Maximum Load Weight: 72 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.
  
- B. 3.0 - Pillow Block: Pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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.
  
- C. 3-R-2 - Pillow Block: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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 2-1/8 inch (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.
  
- D. 3-R-4 - Pillow Block: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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.

## 2.4 ROLLER SUPPORT SERIES

- A. 3-RAH-8: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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.
- B. 3-RAH-12: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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.
- C. 4-RAH-8 SS: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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.
- D. 4-RAH-10: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar,

or other 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.
- E. 4-RAH-12 SS: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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.
- F. 4-RAH-14: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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.
- G. 5-RAH-8: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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.
- H. 5-RAH-12: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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.
- I. 6-RAH-8: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other mechanical piping with the following properties:
1. Base Material: Polycarbonate.
    - a. Deck Base: 16 by 18 inch (406 by 457 mm).
    - b. 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).
    - c. Maximum Load Weight: 578 pounds (262 kg) per pipestand.
  2. Base Material: Type 304 Stainless Steel. (Model 6-RAH-8 SS)
    - a. Deck Base: 12 by 16 inch (305 by 406 mm).
    - b. 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).
    - c. 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.
- J. 6-RAH-12 - Dynamic: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other mechanical piping with the following properties:
1. Base Material: Polycarbonate.
    - a. Deck Base: 16 by 18 inch (406 by 457 mm).
    - b. 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).
    - c. Maximum Load Weight: 578 pounds (262.18 kg) per pipestand.
  2. Base Material: Type 304 Stainless Steel. (Model 6-RAH-12 SS)
    - a. Deck Base: 12 by 16 inch (305 by 406 mm).
    - b. 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).
    - c. 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.
- K. 10-RAH-8 - Dynamic: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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.
- L. 10-RAH-18: Roller bearing pipe support for roof-mounted gas pipes, electrical conduit, solar, or other 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.

## 2.5 STRUT SUPPORT SERIES

- A. 8-Base Strut-2: Pipe support with strut used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical 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.
- B. 8-Base Strut-5: Pipe support with strut used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical 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.
- C. 8-Base Strut-8: Pipe support with strut used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical equipment with the following properties:
1. Base Material: Polycarbonate.
    - a. Deck Base: 7-1/2 by 10 inch (190 by 254 mm).
    - b. 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).
    - c. Maximum Load Weight: 172 pounds (78 kg) per pipestand.
  2. Base Material: Type 304 Stainless Steel. (Model 8-Base Strut-8 SS)
    - a. Deck Base: 12 by 16 inch (305 by 406 mm).
    - b. 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).
    - c. 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.
- D. 8-Base Strut-12: Pipe support with strut used to support roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical equipment with the following properties:
1. Base Material: Polycarbonate.
    - a. Deck Base: 7-1/2 by 10 inch (190 by 254 mm).
    - b. 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).
    - c. Maximum Load Weight: 172 pounds (78 kg) per pipestand.
  2. Base Material: Type 304 Stainless Steel. (Model 8-Base Strut-12 SS)
    - a. Deck Base: 12 by 16 inch (305 by 406 mm).
    - b. 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).
    - c. 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.
- E. 12-Base Strut-8: Strut pipe support system for ganging roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical equipment with the following properties:
1. Base Material: Polycarbonate.
    - a. Deck Base: 9 by 15-1/4 inch (228 by 387 mm).
    - b. 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).
    - c. Maximum Load Weight on Base: 335 pounds (152 kg) per pipestand.
  2. Base Material: Stainless steel. (Model 12-Base Strut-8 SS)
    - a. Deck Base: 12 by 16 inch (305 by 406 mm).
    - b. 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).
    - c. 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.
- F. 12-Base Strut-12: Strut pipe support system for ganging roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical equipment with the following properties:
1. Base Material: Polycarbonate.
    - a. Deck Base: 9 by 15-1/4 inch (228 by 387 mm).
    - b. 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).
    - c. Maximum Load Weight: 335 pounds (152 kg) per pipestand.
  2. Base Material: Stainless steel. (Model 12-Base Strut-12 SS)
    - a. Deck Base: 12 by 16 inch (305 by 406 mm).
    - b. 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).
    - c. 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.
- G. 16-Base Strut-8: Strut pipe support system for ganging roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical 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.
- H. 16-Base Strut-12: Strut pipe support system for ganging roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical 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.
- I. 20-Base Strut-4: Strut pipe support system for ganging roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical 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.
- J. 20-Base Strut-8 - Elevate: Strut pipe support system for ganging roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical 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.
- K. 20-Base Strut-18 - Elevate: Strut pipe support system for ganging roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical 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.
- L. 24-Base Strut-5: Strut pipe support system for ganging roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical 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.
- M. 36-Base Strut-5: Strut pipe support system for ganging roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical 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.
- N. 48-Base Strut-5: Strut pipe support system for ganging roof-mounted electrical conduit, solar piping, solar racking, gas piping, cable trays, or other mechanical 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.

## 2.6 CUSTOM HANGER SUPPORT SERIES

A. 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 requirements 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:

1. Deck Bases:
  - a. Polycarbonate, 9 by 15-1/4 inch (229 by 387 mm).
  - b. Stainless steel, 8 by 14 inch (203 by 356 mm).
  - c. 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: \_\_\_\_\_.
9. Hanger Type:
  - a. Clevis hanger.
  - b. Roller hanger.
  - c. Roller chair.
  - d. Trapeze hanger.
10. If supporting insulated pipe, a shield or saddle shall be used at each hanger location.

B. 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 requirements 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:

1. Deck Bases:
  - a. Polycarbonate, 16 by 18 inch (406 by 457 mm).
  - b. Stainless steel, 12 by 16 inch (305 by 406 mm).
  - c. 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: \_\_\_\_\_.
9. Hanger Type:
  - a. Clevis hanger.
  - b. Roller hanger.
  - c. Roller chair.

- d. Trapeze hanger.
  - 10. If supporting insulated pipe a shield or saddle shall be used.
- C. 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 requirements 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:
- 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: \_\_\_\_\_.
  - 9. Hanger Type:
    - a. Clevis hanger.
    - b. Roller hanger.
    - c. Roller chair.
    - d. Trapeze hanger.
  - 10. If supporting insulated pipe a shield or saddle shall be used.
- D. 16H Model Hanger Support: A versatile custom product able to support a single pipe or multiple pipes at varying heights above the roof. System is designed for various pipe sizes and configurations. The frame structure consists of two load distributing bases below each custom fabricated HSS hot-dip galvanized legs and a header bar. Support is to include appropriate hanger type as specified below. Provide rooftop pipe layout drawings for manufacturer's use and the following:
- 1. Deck Bases: Polycarbonate, Two 16 by 18 inch (406 by 457 mm) per leg.
  - 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: \_\_\_\_\_.
  - 9. Hanger Type:
    - a. Clevis hanger.
    - b. Roller hanger.
    - c. Roller chair.
    - d. Trapeze hanger.
  - 10. If supporting insulated pipe a shield or saddle shall be used.
- E. Custom Stanchioned Model Supports: For rooftop mounted pipe subject to design requirements for wind and seismic forces the supports from the above categories with Stanchioned Supports placed strategically on the roof will provide a code compliant solution.
- 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: \_\_\_\_\_.

7. Structural Design Criteria in accordance with Structural Documents.
8. Wind and Seismic Design Criteria:
  - a. Adopted Building Code: \_\_\_\_\_.
  - b. Building Risk/Occupancy Category: \_\_\_\_\_.
  - c. Wind Design Criteria:
    - 1) Mean Roof Height: \_\_\_\_\_
    - 2) Basic Wind Speed: \_\_\_\_\_ (3 Second Gust).
    - 3) Exposure Category: \_\_\_\_\_
  - d. Seismic Design Criteria:
    - 1) Seismic Design Category: \_\_\_\_\_
    - 2) Design Short Period MCE Spectral Response acceleration,  $S_{DS}$ : \_\_\_\_\_
    - 3) Seismic Component Importance Factor,  $I_E$ : \_\_\_\_\_
9. Appliances and supports that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with ASCE 7 chapter 29.
10. When earthquake loads are applicable in accordance with ASCE 7 chapter 13, mechanical systems and supports shall be designed and installed accordingly.
11. The design requirements for mechanical/electrical components, supports and attachments shall be supported by one of the following methods:
  - a. Project-specific design and documentation submitted for approval to the authority having jurisdiction after review and acceptance by a registered design professional.
  - b. 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.
12. If supporting insulated pipe a shield or saddle shall be used.

## 2.7 CUSTOM DUCT AND CABLE TRAY SUPPORT SERIES

- A. 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:
  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: \_\_\_\_\_.
  11. Provide additional header bar to enclose equipment being supported.
- B. 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 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:
  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: \_\_\_\_\_.
  11. Provide additional header bar to enclose equipment being supported.
- C. 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 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:
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: \_\_\_\_\_.
  9. Provide additional header bar to enclose equipment being supported.
- D. Custom Stanchioned Model Supports: For rooftop mounted pipe subject to design requirements for wind and seismic forces the supports from the above categories with Stanchioned Supports placed strategically on the roof will provide a code compliant solution.
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: \_\_\_\_\_.
  7. Structural Design Criteria in accordance with Structural Documents
  8. Wind and Seismic Design Criteria:
    - a. Adopted Building Code: \_\_\_\_\_.
    - b. Building Risk/Occupancy Category: \_\_\_\_\_.
    - c. Wind Design Criteria:
      - 1) Mean Roof Height: \_\_\_\_\_.
      - 2) Basic Wind Speed: \_\_\_\_\_ (3 Second Gust).
      - 3) Exposure Category: \_\_\_\_\_.
    - d. Seismic Design Criteria:
      - 1) Seismic Design Category: \_\_\_\_\_
      - 2) Design Short Period MCE Spectral Response acceleration,  $S_{DS}$ : \_\_\_\_\_
      - 3) Seismic Component Importance Factor,  $I_E$ : \_\_\_\_\_
  9. Appliances and supports that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with ASCE 7 chapter 29.
  10. When earthquake loads are applicable in accordance with ASCE 7 chapter 13, mechanical systems and supports shall be designed and installed accordingly.
  11. The design requirements for mechanical/electrical components, supports and attachments shall be supported by one of the following methods:

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

## 2.8 MECHANICAL SUPPORTS

- A. 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.
  3. Pan size and height off the roof:
    - a. 20 by 36 inch (508 by 914 mm) at 8 inches (203 mm) above the roof.
    - b. 24 by 24 inch (610 by 610 mm) at 8 inches (203 mm) above the roof.
    - c. 30 by 30 inch (762 by 762 mm) at 8 inches (203 mm) above the roof.
    - d. 36 by 36 inch (914 by 914 mm) at 8 inches (203 mm) above the roof.
  4. Metal Components: Hot-dipped galvanized and stainless steel.
  5. Mechanical Unit Weight: \_\_\_\_\_.
  
- B. 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:
  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).
  4. Platforms: 12 inch (305 mm) Punched Interlock Grating with anti-skid surface.
    - a. Platform Width: \_\_\_\_\_.
    - b. Platform Length: \_\_\_\_\_.
    - c. Minimum Clearance Above Roof: \_\_\_\_\_.
    - d. Mechanical Unit Weight: \_\_\_\_\_.
  5. Platforms: Bar grating.
    - a. Platform Width: \_\_\_\_\_.
    - b. Platform Length: \_\_\_\_\_.
    - c. Minimum Clearance Above Roof: \_\_\_\_\_.
    - d. Mechanical Unit Weight: \_\_\_\_\_.
  6. Rail style support: 1-5/8 inch (41 mm) strut rails.
    - a. Unit Width: \_\_\_\_\_.
    - b. Unit Length: \_\_\_\_\_.
    - c. Minimum Clearance Above Roof: \_\_\_\_\_.
    - d. Mechanical Unit Weight: \_\_\_\_\_.
  
- C. 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:
  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. Platforms: 12 inch (305 mm) Punched Interlock Grating with anti-skid surface.
    - a. Platform Width: \_\_\_\_\_.

- b. Platform Length: \_\_\_\_\_.
  - c. Minimum Clearance Above Roof: \_\_\_\_\_.
  - d. Mechanical Unit Weight: \_\_\_\_\_.
5. Platforms: Bar grating.
- a. Platform Width: \_\_\_\_\_.
  - b. Platform Length: \_\_\_\_\_.
  - c. Minimum Clearance Above Roof: \_\_\_\_\_.
  - d. Mechanical Unit Weight: \_\_\_\_\_.
6. Rail style support: 1-5/8 inch (41 mm) strut rails.
- a. Unit Width: \_\_\_\_\_.
  - b. Unit Length: \_\_\_\_\_.
  - c. Minimum Clearance Above Roof: \_\_\_\_\_.
  - d. Mechanical Unit Weight: \_\_\_\_\_.
- D. Stanchioned Mechanical Support: For rooftop mounted mechanical units, cabinets and other devices subject to design requirements for wind and seismic forces. Supports are to be designed to project specific criteria listed below:
1. Platform Width: \_\_\_\_\_.
  2. Platform Length: \_\_\_\_\_.
  3. Minimum/Maximum Clearance Above Roof: \_\_\_\_\_.
  4. Mechanical Unit Dimensions: \_\_\_\_\_ long by \_\_\_\_\_ wide by \_\_\_\_\_ high.
  5. Mechanical Unit Weight: \_\_\_\_\_.
  6. Structural Design Criteria in accordance with Structural Documents
  7. Wind and Seismic Design Criteria:
    - a. Adopted Building Code: \_\_\_\_\_
    - b. Building Risk/Occupancy Category: \_\_\_\_\_
    - c. Wind Design Criteria:
      - 1) Mean Roof Height: \_\_\_\_\_
      - 2) Basic Wind Speed: \_\_\_\_\_ (3 Second Gust).
      - 3) Exposure Category: \_\_\_\_\_
    - d. Seismic Design Criteria:
      - 1) Seismic Design Category: \_\_\_\_\_
      - 2) Design Short Period MCE Spectral Response acceleration,  $S_{DS}$ : \_\_\_\_\_
      - 3) Seismic Component Importance Factor,  $I_E$ : \_\_\_\_\_
  8. Appliances and supports that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with ASCE 7 chapter 29.
  9. When earthquake loads are applicable in accordance with ASCE 7 chapter 13, mechanical systems and supports shall be designed and installed accordingly.
  10. The design requirements for mechanical/electrical components, supports and attachments shall be supported by one of the following methods:
    - a. Project-specific design and documentation submitted for approval to the authority having jurisdiction after review and acceptance by a registered design professional.
    - b. 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.

## 2.9 SUREFOOT ACCESS PRODUCTS

- A. Crossover Bridges: Custom designed to meet project specific requirements, OSHA 1910 Subpart D standards including handrails, and the following:
1. Clearance Height Required: \_\_\_\_\_.
  2. Clearance Length Required: \_\_\_\_\_.
  3. Crossover Width Required: \_\_\_\_\_ (22 inches (559 mm) minimum).
  4. Deck Bases: Polycarbonate, 16 by 18 inch (406 by 457 mm).

5. Deck Bases: Stainless steel, 12 by 16 inch (305 by 406 mm).
6. Deck Bases: Hot-dipped galvanized steel, 12 by 16 inch (305 by 406 mm).
7. Metal Components: Hot-dipped galvanized steel.
8. Metal Components: Stainless steel.
9. Walking Surfaces: 12 inch (305 mm) Punched Interlock Grating with anti-skid surface.
10. Walking Surfaces: Bar Grating with serrated surface.
11. Walking Surfaces: Fiberglass Grating.
12. 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.
13. Toeboards: 4 inch (102 mm) Toeboards shall be provided whenever, beneath the open side:
  - a. A person can pass;
  - b. There is moving machinery;
  - c. Where falling material could create a hazard.
14. Structural Design Criteria in accordance with Structural Documents
15. Wind and Seismic Design Criteria:
  - a. Adopted Building Code: \_\_\_\_\_.
  - b. Building Risk/Occupancy Category: \_\_\_\_\_.
  - c. Wind Design Criteria:
    - 1) Mean Roof Height: \_\_\_\_\_.
    - 2) Basic Wind Speed: \_\_\_\_\_ (3 Second Gust).
    - 3) Exposure Category: \_\_\_\_\_.
  - d. Seismic Design Criteria:
    - 1) Seismic Design Category: \_\_\_\_\_.
    - 2) Design Short Period MCE Spectral Response acceleration,  $S_{DS}$ : \_\_\_\_\_.
    - 3) Seismic Component Importance Factor,  $I_E$ : \_\_\_\_\_.
16. Crossover structures that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with ASCE 7 chapter 29.
17. When earthquake loads are applicable in accordance with ASCE 7 chapter 13, crossover structures shall be designed and installed accordingly.
18. The design requirements for crossover structures, components, supports and attachments shall be supported by one of the following methods:
  - a. Project-specific design and documentation submitted for approval to the authority having jurisdiction after review and acceptance by a registered design professional.
  - b. 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.

B. Crossover Ramps: Custom designed to meet project specific requirements OSHA 1910 Subpart D standards, and the following:

1. Clearance Height Required: \_\_\_\_\_.
2. Clearance Length Required: \_\_\_\_\_.
3. Ramp Width Required: \_\_\_\_\_ (22 inch (559 mm) minimum.)
4. Deck Bases: Polycarbonate, 16 by 18 inch (406 by 457 mm).
5. Deck Bases: Stainless steel, 12 by 16 inch (305 by 406 mm).
6. Deck Bases: Hot-dipped galvanized steel, 12 by 16 inch (305 by 406 mm).
7. Metal Components: Hot-dipped galvanized steel.
8. Metal Components: Stainless steel.
9. Walking Surfaces: 12 inch (305 mm) Punched Interlock Grating with anti-skid surface.
10. Walking Surfaces: Bar grating with serrated surface.
11. Walking Surfaces: Fiberglass Grating
12. Railings: Standard railings shall be provided on all ramps and platforms 4 feet (1.22 m) or more above adjacent level.
13. Toeboards: 4 inch (102 mm) Toeboards shall be provided whenever, beneath the

open side:

- a. A person can pass;
- b. There is moving machinery;
- c. Where falling material could create a hazard.

14. Structural Design Criteria in accordance with Structural Documents

15. Wind and Seismic Design Criteria:

- a. Adopted Building Code: \_\_\_\_\_.
- b. Building Risk/Occupancy Category: \_\_\_\_\_.
- c. Wind Design Criteria:
  - 1) Mean Roof Height: \_\_\_\_\_.
  - 2) Basic Wind Speed: \_\_\_\_\_ (3 Second Gust).
  - 3) Exposure Category: \_\_\_\_\_.
- d. Seismic Design Criteria:
  - 1) Seismic Design Category: \_\_\_\_\_
  - 2) Design Short Period MCE Spectral Response acceleration,  $S_{DS}$ : \_\_\_\_\_
  - 3) Seismic Component Importance Factor,  $I_E$ : \_\_\_\_\_

16. Ramp structures that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with ASCE 7 chapter 29.

17. When earthquake loads are applicable in accordance with ASCE 7 chapter 13, ramp structures shall be designed and installed accordingly.

18. The design requirements for ramp structures, components, supports and attachments shall be supported by one of the following methods:

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

C. Service Platforms: Custom designed to meet project specific requirements OSHA 1910 Subpart D standards, and the following:

1. Clearance Height Required: \_\_\_\_\_.
2. Required Length of Platform: \_\_\_\_\_.
3. Required Width of Platform: \_\_\_\_\_.
4. Deck Bases: Polycarbonate, 16 by 18 inch (406 by 457 mm).
5. Deck Bases: Stainless steel, 12 by 16 inch (3058 by 406 mm).
6. Deck Bases: Hot-dipped galvanized steel, 12 by 16 inch (305 by 406 mm).
7. Metal Components: Hot-dipped galvanized steel.
8. Metal Components: Stainless steel.
9. Walking Surfaces: 12 inch (305 mm) Punched Interlock Grating with anti-skid surface.
10. Walking Surfaces: Bar grating with serrated surface.
11. Walking Surfaces: Fiberglass Grating.
12. Railings: Standard railings shall be provided on all ramps and platforms 4 feet (1.22 m) or more above adjacent level.
13. Toeboards: 4 inch (102 mm) Toeboards shall be provided whenever, beneath the open side:
  - a. A person can pass;
  - b. There is moving machinery;
  - c. Where falling material could create a hazard.

14. Structural Design Criteria in accordance with Structural Documents

15. Wind and Seismic Design Criteria:

- a. Adopted Building Code: \_\_\_\_\_.
- b. Building Risk/Occupancy Category: \_\_\_\_\_.
- c. Wind Design Criteria:
  - 1) Mean Roof Height: \_\_\_\_\_.

- 2) Basic Wind Speed:\_\_\_\_\_ (3 Second Gust).
- 3) Exposure Category:\_\_\_\_\_.
- d. Seismic Design Criteria:
  - 1) Seismic Design Category:\_\_\_\_\_.
  - 2) Design Short Period MCE Spectral Response acceleration,  $S_{DS}$ :\_\_\_\_\_.
  - 3) Seismic Component Importance Factor,  $I_E$ :\_\_\_\_\_.
- 16. Service Platform structures that are exposed to wind shall be designed and installed to resist wind pressures determined in accordance with ASCE 7 chapter 29.
- 17. When earthquake loads are applicable in accordance with ASCE 7 chapter 13, Service Platform structures shall be designed and installed accordingly.
- 18. The design requirements for Service Platform structures, components, supports and attachments shall be supported by one of the following methods:
  - a. Project-specific design and documentation submitted for approval to the authority having jurisdiction after review and acceptance by a registered design professional.
  - b. 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.

## 2.10 ACCESSORIES

- A. 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.
  - 2. Dimensions: Fitted 19 by 23 inch (483 by 584 mm).
  - 3. Dimensions: Fitted 16 by 18 inch (406 by 457 mm).
  - 4. Dimensions: Fitted 9 by 15 inch (230 by 381 mm).
  - 5. Dimensions: Fitted 7 by 10 inch (178 by 254 mm).
  - 6. Dimensions: 12 by 12 inch (304.8 by 305 mm).
  - 7. Dimensions: Custom size as recommended by the manufacturer.
- B. 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.
  - 2. Dimensions: 12 by 12 inch (305 by 305 mm).
  - 3. Dimensions: Custom size as recommended by the manufacturer.
- C. 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.
  - 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: Custom size per job specific requirements.
- D. Spacers: Polycarbonate structure with gently rounded base, drainage holes and alignment pins that attached to other components to increase height.
  - 1. Size: 1.5.

2. Size: 3-R.
- E. 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.
  1. Installation: Field installed.
  2. Installation: Factory installed in the 3-R-4 support.
- F. Rollers: Heavy duty support roller of polycarbonate resin.
  1. Size: 3 inch (76 mm).
  2. Size: 5 inch (127 mm).

## PART 3 EXECUTION

### 3.1 EXAMINATION

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

### 3.2 PREPARATION

- A. Clean roofing surfaces in accordance with the roofing manufacturer's instructions prior to installation.
- B. 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 footprint.

### 3.3 INSTALLATION

- A. MIRO supports shall be installed as per the product specifications and or project specific submittals.
- B. Install an additional sheet of roofing material, a support pad, or a deck plate beneath the base of each stand.
- C. 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 pipe in support without dropping or causing undue impact.
- D. 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.
- E. Fixed Anchor Stanchion Supports: Prior to installation of roof decking, insulation and roof membrane attach support to roof structure as indicated on drawings.
  1. After installation of roof decking, insulation and membrane, install pipe or rooftop mechanical supports used in connection with fixed anchor supports.
  2. Install piping or mechanical units on each support.

### 3.4 FIELD QUALITY CONTROL

- A. When requested by Architect, 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.
- B. 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.

### 3.5 PROTECTION

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

END OF SECTION