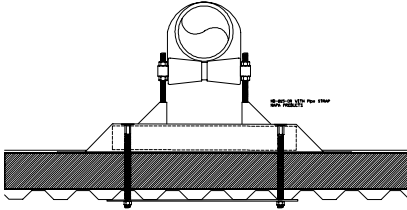
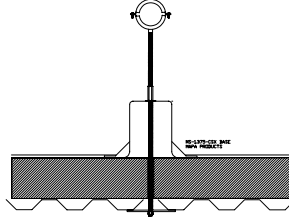


Recommended Installation Procedures (Structural Support Systems for Rooftop Piping and Ductwork)

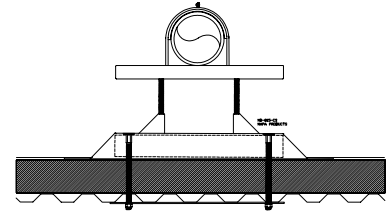
Examples:



MX-5RA9-SA with pipe strap



MX1.375-SA with clamp



MX-14SA9-SA with pipe clamp

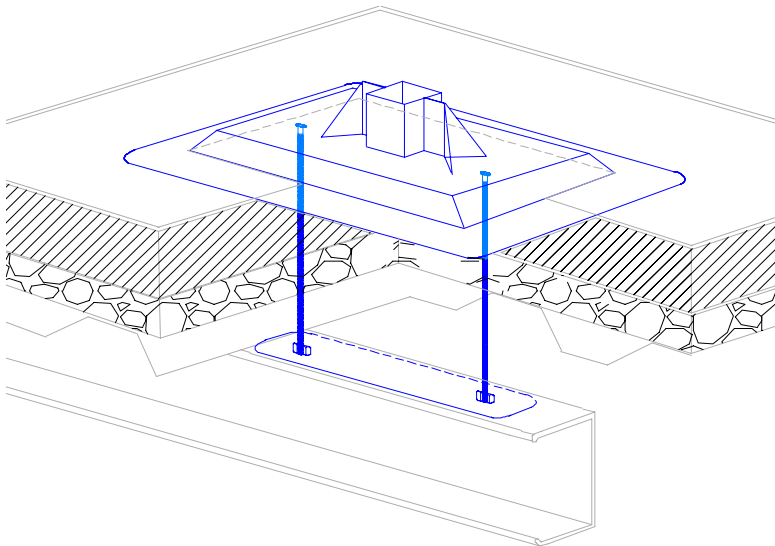
MAPA Products pipe supports are designed in accordance with the 2003 International Fuel Gas Code as referred by the 2003 International Building Code specifically to meet the MSS SP-58 requirements.

All Curb Support Series are designed in accordance with MSS SP-127-2001, MSS SP-69-2002 and MSS SP-58-2002. Adjustable support models are designed specifically to comply with MSS SP-127-2001 Section 4.1c for the support of single pipes 4"IPS and smaller a maximum of 12" from bottom of pipe to roof deck.

The MAPA Curb Support Series provides a manufactured curb support upon which to mount equipment and piping systems. The design of the Curb Support provides for fewer disturbances to the roof membrane by minimizing the overall area that must be flashed during installation.

The following installation details refer to MAPA's recommendations for anchoring these support bases to the building structure. MAPA Product's goal is to provide a structurally sound support base with which the engineer may design rooftop piping and equipment supports to meet the specific codes for their seismic or high wind zone. Refer to engineering specifications for attaching the supports to the roof.

Figure 1-Basic penetration for securing base



Note: MAPA Products does not perform engineering design; the structural engineer is responsible for confirming that the structure upon which supports are installed is designed in accordance with accepted design codes and standards which allow for the installation of rooftop equipment and piping. Further MAPA Products shall not be liable for damage or injury caused by the improper use or installation of the product.

Installation Procedures

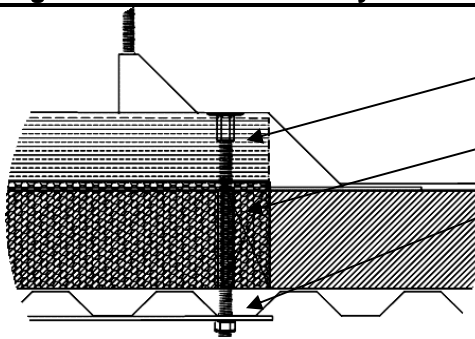
IMPORTANT: Prior to beginning installation, the installer should familiarize themselves with exact base models and accessories to be utilized for the project and have an overall understanding of how the installation is to be completed.

- Generally, supports should be evenly spaced 6' to 10' apart so that weights are evenly distributed or as otherwise stated in the project specifications. Project plans and specifications shall designate the location of support platforms. If applicable, remove ballast and/or debris from the designated support area prior to placing support platforms.
 - *Where the MX1.375-SA Series Base is utilized for cable brace attachment, locations shall be designated by the project engineer's specifications. (See Figure 5)*
- Make penetrations where applicable through roof membrane, insulation and deck to structural member(s) to which supports are to be attached (See Figure 1). Use the provided support base template on roof surface at the designated support location.
 - As designated by the project engineer's specifications and/or roofing manufacturer recommendation:
 - Remove roof membrane from support perimeter.

And/Or

 - Remove insulation to expose roof deck. Replace insulation with structural blocking (See Table 1 and Figure 2 for recommendations on support blocking installation for reinforcement up to the roof surface at support base flange).
- Install 3/8"x16" stainless steel all thread rod (ATR) to receiving studs on underside of support base.

Figure 2-Installation cutaway for additional blocking

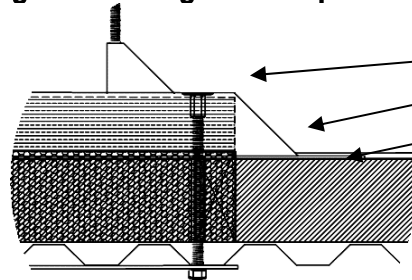


- Available MAPA B1 or B3 composite blocking to reinforce support cavity for increased load weight.
- Optional structural blocking to roof deck per Table 1 or as specified by design engineer.
- Available attachment kit for positive attachment to structural steel.

- If cavity blocking is to be utilized for the support base, place either MAPA B1 or B3 blocking, inside cavity of the support, then align ATR with penetrations made previously and set support flush with roof surface.
 - *For Recommendations See Table 1-Curbed HD Support Base Configurations and Design Specifications*
- From the underside of the roof structure, secure support to structural members with MAPA UDC (*Under Deck Clamp*) or other structural support bracing as designated by the project engineer's specifications.
- Repeat installation for all support locations.

Finalizing the Installation:

Figure 3-Sealing the base perimeter

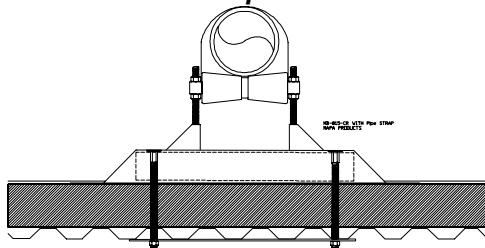


- Overlap top membrane to support platform.
- Strip into top of flange for membrane roofs
- Seal underside of support plate with approved mastic.

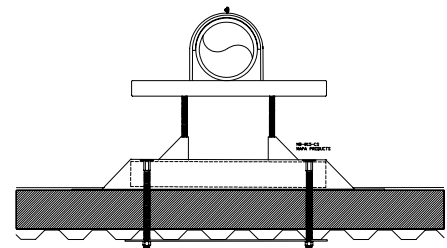
- As designated by the project engineer's specifications or roofing manufacturer recommendation, seal perimeter of the support base in order to insure a watertight installation (See Figure 3). If applicable, replace ballast around support.
 - Note: This step should be done in sequence as determined by the application, whether prior to loading of the support system or upon completion.
- For trapeze supports, typically trapeze will be shipped pre-assembled with either roller or standard clevis hangers as specified by the design engineer. Place vertical strut legs into receiver on the support platform, and then bolt in place with provided hardware.
- Place piping, equipment or duct on the support or within the hangers of the trapeze as appropriate for the installation. Single piping should be centered with multiple pipes spaced equally on the support. In all cases, weight should be evenly distributed on the support and overall system load is balanced so as not to cause undo strain on any individual support.
 - **Note: Supports are not intended as a platform for piping assembly, but when used as such, care should be taken to avoid damage to the support and surrounding roof area.**
- Where Single Post units are used with stainless two-piece clamps to support piping, remove top section of clamp, insert pipe and secure by reconnecting upper and lower clamp segments with provided stainless screws. Vertical adjustments should be made with regard to the nature of the installation, either leveled or tapered for flow.

Figure 4-(Drawings illustrate typical applications. Refer to specifications for exact installation details.)

Optional installations procedures based on governing code compliance



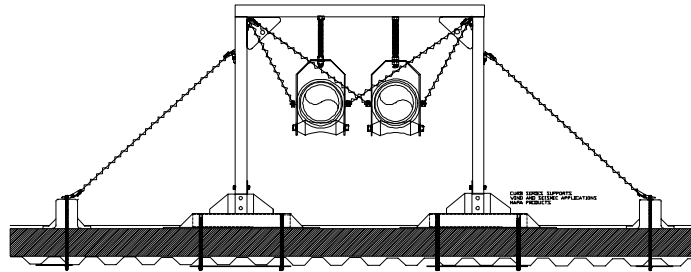
MX-5RA9-SA with pipe strap



MX-14SA9-SA with pipe clamp

- For roller and strut supports, clamp piping to strut as directed by project specifications. If pipe straps are required, adjust to allow for movement of piping due to thermal expansion or as otherwise stated in the project specifications (See Figure 4).

Figure 5



- Where applicable, connect SCB cable bracing assemblies to MX1.375-SA Base then to the vertical strut members of the trapeze support, set tension on cabling to comply with governing codes (See Figure 6).
- Where utilized, install riser clamp to piping at a longitudinal distance equal to the distance from the centerline of piping to the top of trapeze top brace. Attach restraining cable brace to clamp and then to vertical members of trapeze support or as indicated by engineering specifications and/or details (See Figure 6).

Seismic Cable Bracing:

- Attach SBC to vertical struts then to riser clamps.
- Set longitudinal distance of riser clamp equal to the distance of trapeze top brace to centerline of pipe.
- Set tension to comply with governing codes.
- Tighten all connections.

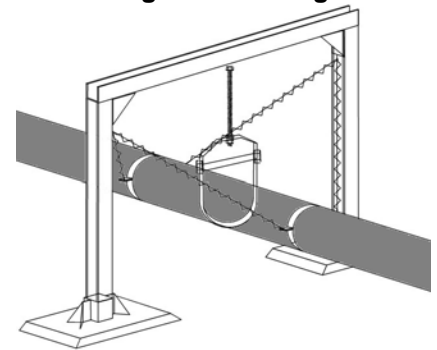
Clevis Cross Bracing:

- Attach directly to clevis cross bolt or on the support rod at top of clevis.

Seismic Rod Clamps:

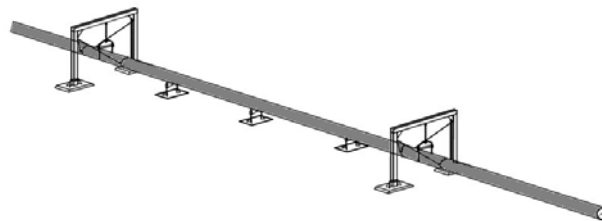
- Attach angle brace (field provided) at three points along all thread support rod with SRC equally spaced from center of all thread rod.

Figure 6-Bracing



- Where distance between structurally attached supports exceeds 10', install MAPA non-penetrating support bases as supplemental support between Structural Support Systems. Follow MAPA Products "Recommended Installation Procedures for non-penetrating support systems". (See Figure 7)

Figure 7



Restraining supports should be spaced at the discretion of the designing engineer with freestanding/non-penetrating supports supplementing at intervals no greater than 10'.

- Supports should be cross-braced at intervals as stated by design engineer in project specifications. Where not specified by design engineer, MAPA Products recommends cross-bracing where support height meets or exceeds 24" and/or where the distance from roof surface to bottom of pipe or cross member for duct exceeds 12", then as needed where undo sway is detected after installation is complete.

MX-1.XXX-SA

(Drawings illustrate typical applications. Refer to specifications for exact installation details.)

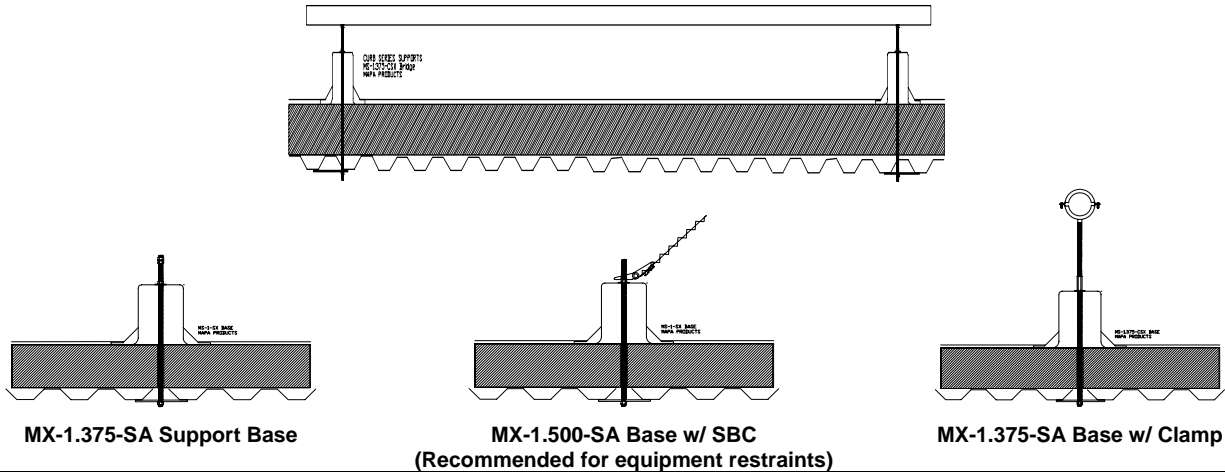


Table 1-Curved HD Support Base Configurations and Design Specifications
Maximum load weight per base

Model	Description	Max Weight	Max Weight w/ Cavity Blocking
* MX-146-SA	Bracket receives vertical attachment of a standard 1-5/8" square strut allowing multiple support configurations.	165 lbs	500 lbs
** MX-14SA9-SA	Strut Support with 10" adjustable rod assembly 1-5/8" Strut.	165 lbs	250 lbs
** MX-5RA9-SA	Roller Support with 10" adjustable rod assembly For 5" and smaller IPS	165 lbs	250 lbs
** MX-8RA9-SA	Roller Support with 10" adjustable rod assembly For 8" and smaller IPS	165 lbs	250 lbs
** MX-10RA9-SA	Roller Support with 10" adjustable rod assembly For 10" and smaller IPS	165 lbs	250 lbs
*** MX-1.375-SA	Single Post Support with 3/8" ATR	75 lbs	75 lbs
MX-1.375-SA 3' Bridge	3' Bridge for multiple piping or equipment	300 lbs	NA
+ MX-1.500-SA	Single Post Support with 1/2" ATR	250 lbs	NA
+ MX-1.750-SA	Single Post Support with 3/4" ATR	250 lbs	NA

* Replace insulation with structural support blocking where system weight is greater than 330 lbs. or where distance from bottom of pipe exceeds 12" or where vertical support height exceeds 24".

** Replace insulation with structural support blocking for fluid systems => 4" or where specified by the design engineer.

*** Weight limit based on contact area to roof surface of 50 sq. in. at 5 lbs. per sq. in.

+ The use of structural blocking transfers load directly to the structure allowing for increased loads as approved by the structural engineer. Where MX-1(.xxx)-SA supports are utilized this should not exceed 500 lbs.

Table 2-Engineering Data

	Resisting Moment	Shear	Tension	Pipe OD (Inches)	Height Center Line OD Pipe (Inches)	Spacing (Feet)	Safety Factor
MX-1.375-SA	16.50 ft-lbs	1000 lbs	2200 lbs	1/2	6	8.5	1.667
				3/4	6	6.7	1.667
				1	6	5.4	1.667
				1-1/4	6	4.5	1.667
				1-1/2	6	3.6	1.667
MX-1.500-SA	39.50 ft-lbs	1960 lbs	3900 lbs	2	6	3.0	1.667
				NA	NA	NA	1.667
MX-1.750-SA	133.46 ft-lbs	4400 lbs	8800 lbs	NA	NA	NA	1.667
<i>Note: 1.667 safety factor is normal when using AISC Steel Manual</i>							
MX-146C-SA w/ 3/8" Structural Attachment 60' / 150 mph Qz=56.3psf							
				3"			8.04
				4"			6.11
				6"			4.02

Engineering Data Provided By: Patterson Engineering, Texarkana, Texas

Table 3-Usual and Customary Pipe Sizes

Pipe Size	Steel / Plastic (Sch. 40 / 80)			Electric Heavy Wall OD	Electric EMT OD	Stainless Steel Tube OD	Copper types K,L,M & DWV OD
	OD	Sch. 40 Steel					
		Empty (lbs.)	Pipe w/ H2O (lbs.)				
1/2"	.840	8.51		.840	.706	.500	.625
3/4"	1.050	11.31		1.050	.922	.750	.875
1"	1.315	16.79	20.79	1.315	1.163	1.000	1.125
1 1/4"	1.660	22.73	29.73	1.660	1.510	1.250	1.375
1 1/2"	1.900	27.18	36.18	1.900	1.740	1.500	1.625
2"	2.375	36.53	51.53	2.375	2.197	2.000	2.125
2 1/2"	2.875	57.93	78.93	2.875	2.875	2.500	2.625
3"	3.500	75.76	107.76	3.500	3.500	3.000	3.125
3 1/2"	4.000	91.09	133.09	4.000		3.500	3.625
4"	4.500	107.90	159.90	4.500	4.500	4.000	4.125
5"	5.563	146.20	233.20	5.563			
6"	6.625	189.70	313.70	6.625			
8"	8.625	285.50	505.50	8.625			
10"	10.750	404.80	744.80	10.750			
12"	12.750	495.60	985.60				
14"	14.000	545.70	1145.70				
16"	16.000	625.80	1415.80				

Note:

- Fractional numbers reflect nominal pipe diameter, decimal numbers reflect actual O.D. in inches.
- Pipe weights per 10' of Schedule 40 Steel Pipe. Due to variations between domestic and foreign pipe sizes and manufacturers, this chart should only be used for approximations. Specific dimensions should be obtained from the pipe manufacturer.
- Weights and diameters are provided without regard to insulation.



Design Criteria:

Information contained within MAPA Products "Recommended Installation Procedures" is provided as reference for the design engineer. Maximum weight limits provided for individual models is based upon the generally associated typical usage of the support. Every project provides it own unique challenges when designing for seismic and high wind forces. Design should meet accepted governing codes for these forces within a specific zone.

For specific challenges where project design requires custom fabrication for greater adjustability, increased elevations or greater weight loads, additional flanges, material changes, etc. may be incorporated into the design. The project engineer is encouraged to contact MAPA Products for support in these situations.

In all cases the information provided by the design engineer and/or the roofing material manufacturer should supersede the recommendations made within this document. Where conflicting procedures occur, always consult the engineer of record for final determination.

Maintenance:

Often, damage to piping and supports systems occurs during routine maintenance, renovations and/or improvements. This type of damage is difficult to verify, therefore MAPA Products must be notified ten (10) days in advance of roof traffic in conjunction with any major maintenance, renovations and/or improvements and upon completion of said traffic. Damage caused by said traffic is not warranted. Refer to MAPA Products warranty effective September 2005.

MAPA Products

This document is copyrighted. This document may not in whole or part, be copied, duplicated, reproduced, translated, electronically stored, or reduced to machine readable form without prior written consent from **MAPA Products, LLC**.

Although the material contained herein has been carefully reviewed, **MAPA Products, LLC** does not warrant it to be free of errors or omissions. **MAPA Products** reserves the right to make corrections, updates, revisions, or changes to the information contained herein.

Printed in the United States of America.