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Puyallup, WA 98371

Job #11-2418

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Seismic Brace Report

Project Name PSE OTC
Date 05/23/2024

APPROVAL STAMP

- ☐ Approved
- ☐ Approved as Noted
- ☐ Not Approved

Remarks:

Standard NFPA 13-2016

BRACE SUMMARY

Brace Name	Drawing Reference	Seismic Design Load	Structure	Brace Description	Fastener	Attachments
6" BULK LAT	SB-01	878 lbf.	Horizontal Beam Flange	Lateral Orientation 45° - 90° 1 NPS Sch 40		AF720 AF700 - 1/2" AF035 - 6 NPS x 1 NPS
6" BULK LONG	SB-02	1,120 lbf.	Horizontal Beam Flange	Longitudinal Orientation 45° - 90° 1 NPS Sch 40		AF720 AF700 - 1/2" AF730 - 6 NPS
6" lat w/lines (1.5)	SB-03	1,102 lbf.	Horizontal Beam Flange	Lateral Orientation 45° - 90° 1 NPS Sch 40		AF720 AF700 - 1/2" AF035 - 6 NPS x 1 NPS
6" lat w/lines (2.5)	SB-04	1,111 lbf.	Horizontal Beam Flange	Lateral Orientation 45° - 90° 1 NPS Sch 40		AF720 AF700 - 1/2" AF035 - 6 NPS x 1 NPS
2.5" LAT W/LINES (1.5)	SB-05	572 lbf.	Horizontal Beam Flange	Lateral Orientation 45° - 90° 1 NPS Sch 40		AF720 AF700 - 1/2" AF035 - 2 1/2 NPS x 1 NPS
2.5" LONG	SB-06	438 lbf.	Horizontal Beam Flange	Longitudinal Orientation 45° - 90° 1 NPS Sch 40		AF720 AF700 - 1/2" AF730 - 2 1/2 NPS
6" LAT W/LINES (2/1.5)	SB-07	881 lbf.	Horizontal Beam Flange	Lateral Orientation 45° - 90° 1 NPS Sch 40		AF720 AF700 - 1/2" AF035 - 6 NPS x 1 NPS
4" LAT	SB-08	455 lbf.	Horizontal Beam Flange	Lateral Orientation 45° - 90° 1 NPS Sch 40		AF720 AF700 - 1/2" AF035 - 4 NPS x 1 NPS
4" LONG	SB-09	909 lbf.	Horizontal Beam Flange	Longitudinal Orientation 45° - 90° 1 NPS Sch 40		AF720 AF700 - 1/2" AF730 - 4 NPS
4" LAT W/LINES (1.5/2)	SB-10	1,376 lbf.	Horizontal Beam Flange	Lateral Orientation 60° - 90° 1 NPS Sch 40		AF720 AF700 - 1/2" AF035 - 4 NPS x 1 NPS
4" LAT W/LINES (2")	SB-11	952 lbf.	Horizontal Beam Flange	Lateral Orientation 45° - 90° 1 NPS Sch 40		AF720 AF700 - 1/2" AF035 - 4 NPS x 1 NPS
2"LAT W/LINES	SB-12	130 lbf.	Horizontal Beam Flange	Lateral Orientation 45° - 90° 1 NPS Sch 40		AF720 AF700 - 1/2" AF035 - 2 NPS x 1 NPS

2" LONG	SB-13	143 lbf.	Horizontal Beam Flange	Longitudinal Orientation 45° - 90° 1 NPS Sch 40	AF720 AF700 - 1/2" AF730 - 2 NPS
2.5 LAT LONG LINES	SB-14	577 lbf.	Horizontal Beam Flange	Lateral Orientation 45° - 90° 1 NPS Sch 40	AF720 AF700 - 1/2" AF035 - 2 1/2 NPS x 1 NPS

NOTE: Per NFPA 13-2016, all load capacities listed for fasteners installed in cracked concrete have been reduced based on the prying factors listed for ASC's swivel attachments. Prying factors for NFPA fastener orientations “A” through “I” may be found in ASC's individual product submittal at asc-es.com

NFPA 13-2016 Product loads incorporate a minimum safety factor of 1.5. NFPA 13-2019 FM Product loads have been reduced to include a safety factor of 2.2 unless noted in the applicable product submittal.

The products specified within this report are limited to the capability of the sway brace assembly alone to resist the calculated seismic force resulting from user input . Point loads applied to structural elements as a result of seismic forces are not evaluated by the software. The seismic load rating of the fastener attached to a structural element is determined by one of the following: NFPA 13, UL listing, FM Global approval, or other empirical testing. The review of the of the structural element(s) as a whole and/or the entire structure and its ability to resist the seismic load(s) is beyond the scope of these seismic calculations.

ASC MAKES NO WARRANTIES , EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, WITH RESPECT TO THE SOFTWARE OR THE SEISMIC CALCULATIONS, AND ASC SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

6" BULK LAT - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	6" BULK LAT
Standard	NFPA 13-2016	**Drawing Reference**	SB-01
Brace Type	Lateral	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Perpendicular to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

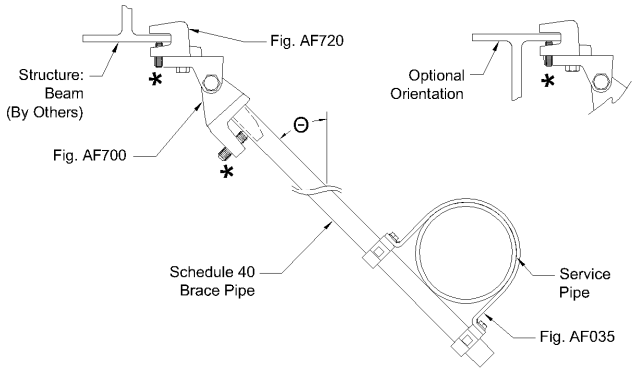
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF035	6 NPS x 1 NPS	1,955 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



** - denotes hardware shown with the bolt head or nut broken off, as per the product installation instructions*
Net Vertical Reaction Forces do not need to be addressed per NFPA 13-2016.

SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	6 NPS Steel Sch 40	40.00 ft.	31.69 lb/ft.	1,267.60 lb.	1,267.60 lb.

Weakest Main Size	Spacing	Max Fpw
6 NPS Steel Sch 40	40 ft.	3,713 lbf.

Total System Weight	1,267.60 lb.
System Design Weight (W_p)	1,458.00 lb.
Horizontal Seismic Load (Fpw)	878 lbf.

6" BULK LONG - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	6" BULK LONG
Standard	NFPA 13-2016	**Drawing Reference**	SB-02
Brace Type	Longitudinal	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Parallel to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

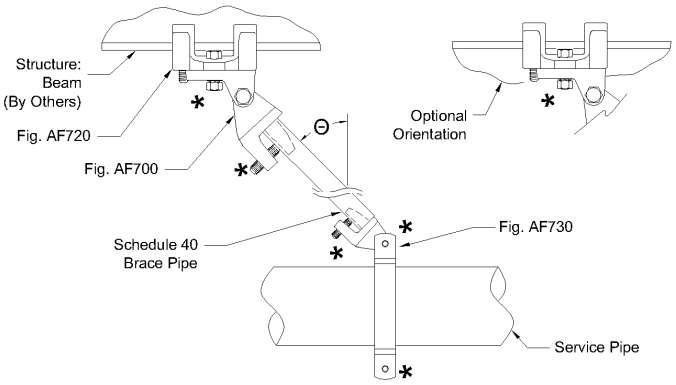
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF730	6 NPS	1,333 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



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SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	6 NPS Steel Sch 40	51.00 ft.	31.69 lb/ft.	1,616.19 lb.	1,616.19 lb.

Total System Weight	1,616.19 lb.
System Design Weight (W_p)	1,859.00 lb.
Horizontal Seismic Load (Fpw)	1,120 lbf.

6" LAT W/LINES (1.5) - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	6" lat w/lines (1.5)
Standard	NFPA 13-2016	**Drawing Reference**	SB-03
Brace Type	Lateral	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Perpendicular to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

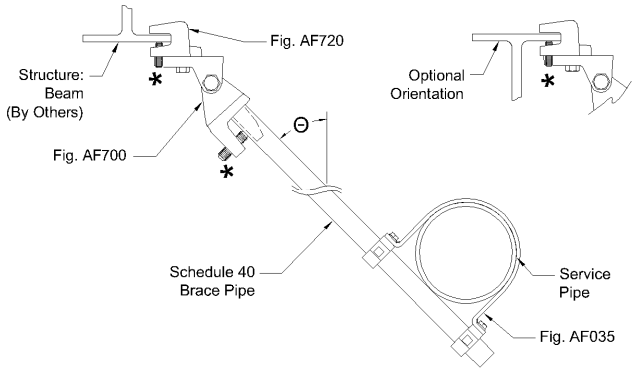
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF035	6 NPS x 1 NPS	1,955 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



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SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	6 NPS Steel Sch 40	24.00 ft.	31.69 lb/ft.	760.56 lb.	760.56 lb.
1	Branch 1	Segment A	1 1/2 NPS Steel Sch 40	124.00 ft.	3.61 lb/ft.	447.64 lb.	447.64 lb.
1	Branch 1	Riser Nipple	1 1/2 NPS Steel Sch 40	2.00 ft.	3.61 lb/ft.	7.22 lb.	7.22 lb.
1	Branch 2	Segment A	1 1/2 NPS Steel Sch 40	102.00 ft.	3.61 lb/ft.	368.22 lb.	368.22 lb.
1	Branch 2	Riser Nipple	1 1/2 NPS Steel Sch 40	2.00 ft.	3.61 lb/ft.	7.22 lb.	7.22 lb.

Weakest Main Size	Spacing	Max Fpw
6 NPS Steel Sch 40	25 ft.	6,314 lbf.

Branch	Riser Nipple	Section Mod	Fy Max	Fy
1	1 1/2 NPS Steel Sch 40	0.3260 in^3	30,000 psi	20,159 psi
2	1 1/2 NPS Steel Sch 40	0.3260 in^3	30,000 psi	16,640 psi

Total System Weight	1,590.86 lb.
System Design Weight (W_p)	1,830.00 lb.
Horizontal Seismic Load (Fpw)	1,102 lbf.

6" LAT W/LINES (2.5) - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	6" lat w/lines (2.5)
Standard	NFPA 13-2016	**Drawing Reference**	SB-04
Brace Type	Lateral	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Perpendicular to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

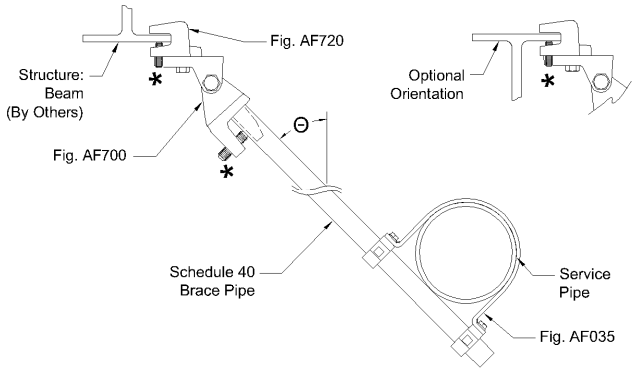
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF035	6 NPS x 1 NPS	1,955 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



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SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	6 NPS Steel Sch 40	17.00 ft.	31.69 lb/ft.	538.73 lb.	538.73 lb.
2	Branch 1	Segment A	2 1/2 NPS Steel Sch 40	64.00 ft.	7.89 lb/ft.	504.96 lb.	1,009.92 lb.
2	Branch 1	Riser Nipple	3 NPS Steel Sch 40	2.50 ft.	10.82 lb/ft.	27.05 lb.	54.10 lb.

Weakest Main Size	Spacing	Max Fpw
6 NPS Steel Sch 40	20 ft.	7,893 lbf.

Branch	Riser Nipple	Section Mod	Fy Max	Fy
1	3 NPS Steel Sch 40	1.7240 in^3	30,000 psi	5,574 psi

Total System Weight	1,602.75 lb.
System Design Weight (W_p)	1,844.00 lb.
Horizontal Seismic Load (Fpw)	1,111 lbf.

2.5" LAT W/LINES (1.5) - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	2.5" LAT W/LINES (1.5)
Standard	NFPA 13-2016	**Drawing Reference**	SB-05
Brace Type	Lateral	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Perpendicular to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

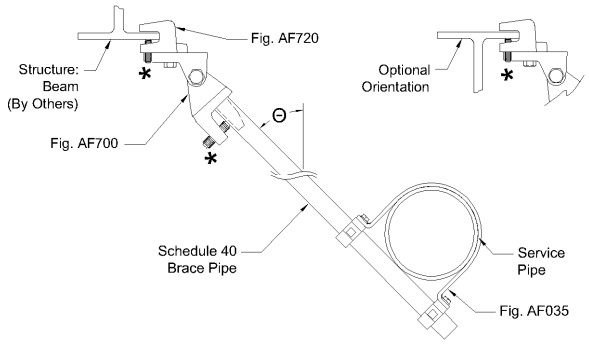
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF035	2 1/2 NPS x 1 NPS	1,955 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



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SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	2 1/2 NPS Steel Sch 40	30.00 ft.	7.89 lb/ft.	236.70 lb.	236.70 lb.
2	Branch 1	Segment A	1 1/2 NPS Steel Sch 40	78.00 ft.	3.61 lb/ft.	281.58 lb.	563.16 lb.
2	Branch 1	Riser Nipple	2 NPS Steel Sch 40	2.50 ft.	5.13 lb/ft.	12.82 lb.	25.64 lb.

Weakest Main Size	Spacing	Max Fpw
2 1/2 NPS Steel Sch 40	30 ft.	645 lbf.

Branch	Riser Nipple	Section Mod	Fy Max	Fy
1	2 NPS Steel Sch 40	0.5610 in^3	30,000 psi	9,478 psi

Total System Weight	825.51 lb.
System Design Weight (W_p)	950.00 lb.
Horizontal Seismic Load (Fpw)	572 lbf.

2.5" LONG - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	2.5" LONG
Standard	NFPA 13-2016	**Drawing Reference**	SB-06
Brace Type	Longitudinal	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Parallel to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

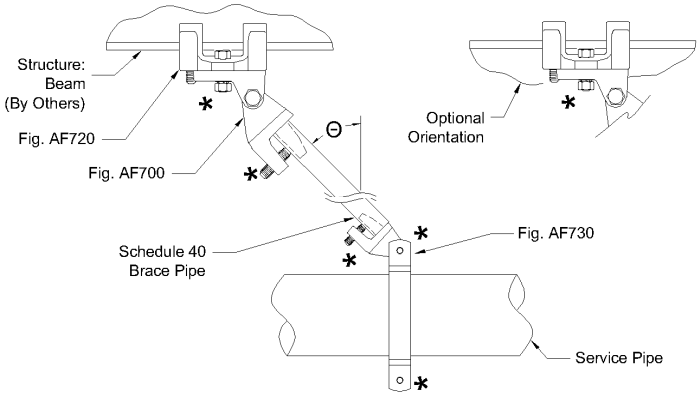
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF730	2 1/2 NPS	770 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



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Net Vertical Reaction Forces do not need to be addressed per NFPA 13-2016.

SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	2 1/2 NPS Steel Sch 40	80.00 ft.	7.89 lb/ft.	631.20 lb.	631.20 lb.

Total System Weight	631.20 lb.
System Design Weight (W_p)	726.00 lb.
Horizontal Seismic Load (Fpw)	438 lbf.

6" LAT W/LINES (2/1.5) - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	6" LAT W/LINES (2/1.5)
Standard	NFPA 13-2016	**Drawing Reference**	SB-07
Brace Type	Lateral	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Perpendicular to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

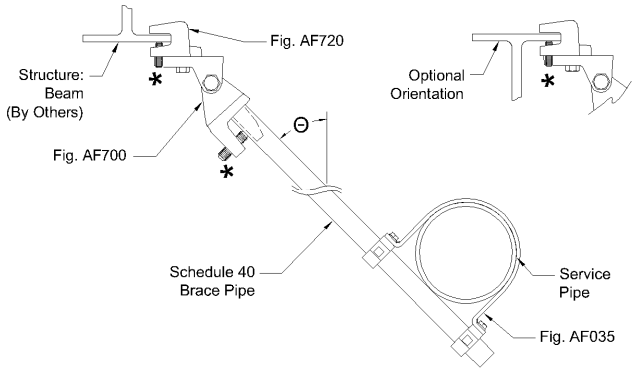
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF035	6 NPS x 1 NPS	1,955 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



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Net Vertical Reaction Forces do not need to be addressed per NFPA 13-2016.

SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	6 NPS Steel Sch 40	30.00 ft.	31.69 lb/ft.	950.70 lb.	950.70 lb.
1	Branch 1	Segment A	1 1/2 NPS Steel Sch 40	56.00 ft.	3.61 lb/ft.	202.16 lb.	202.16 lb.
1	Branch 1	Riser Nipple	1 1/2 NPS Steel Sch 40	1.00 ft.	3.61 lb/ft.	3.61 lb.	3.61 lb.
1	Branch 2	Segment A	2 NPS Steel Sch 40	21.50 ft.	5.13 lb/ft.	110.30 lb.	110.30 lb.
1	Branch 2	Riser Nipple	2 NPS Steel Sch 40	1.00 ft.	5.13 lb/ft.	5.13 lb.	5.13 lb.

Weakest Main Size	Spacing	Max Fpw
6 NPS Steel Sch 40	30 ft.	5,173 lbf.

Branch	Riser Nipple	Section Mod	Fy Max	Fy
1	1 1/2 NPS Steel Sch 40	0.3260 in^3	30,000 psi	4,560 psi
2	2 NPS Steel Sch 40	0.5610 in^3	30,000 psi	1,487 psi

Total System Weight	1,271.89 lb.
System Design Weight (W_p)	1,463.00 lb.
Horizontal Seismic Load (Fpw)	881 lbf.

4" LAT - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	4" LAT
Standard	NFPA 13-2016	**Drawing Reference**	SB-08
Brace Type	Lateral	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Perpendicular to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

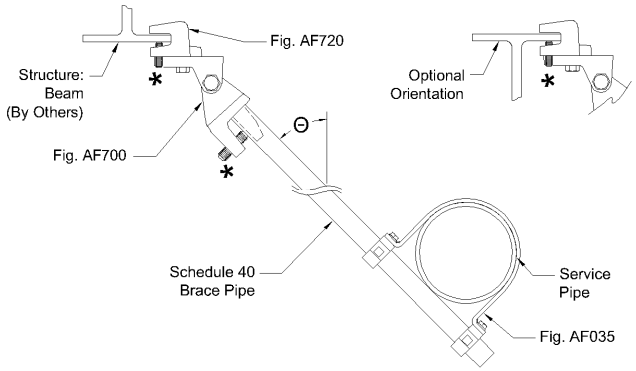
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF035	4 NPS x 1 NPS	1,955 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



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Net Vertical Reaction Forces do not need to be addressed per NFPA 13-2016.

SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	4 NPS Steel Sch 40	40.00 ft.	16.40 lb/ft.	656.00 lb.	656.00 lb.

Weakest Main Size	Spacing	Max Fpw
4 NPS Steel Sch 40	40 ft.	1,402 lbf.

Total System Weight	656.00 lb.
System Design Weight (W_p)	755.00 lb.
Horizontal Seismic Load (Fpw)	455 lbf.

4" LONG - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	4" LONG
Standard	NFPA 13-2016	**Drawing Reference**	SB-09
Brace Type	Longitudinal	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Parallel to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

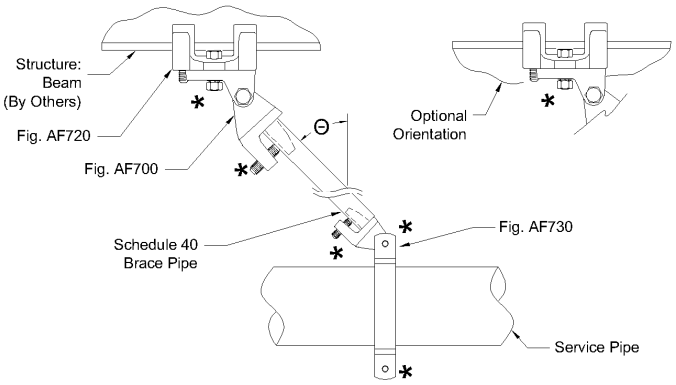
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF730	4 NPS	1,333 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



** - denotes hardware shown with the bolt head or nut broken off, as per the product installation instructions*
Net Vertical Reaction Forces do not need to be addressed per NFPA 13-2016.

SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	4 NPS Steel Sch 40	80.00 ft.	16.40 lb/ft.	1,312.00 lb.	1,312.00 lb.

Total System Weight	1,312.00 lb.
System Design Weight (W_p)	1,509.00 lb.
Horizontal Seismic Load (Fpw)	909 lbf.

4" LAT W/LINES (1.5/2) - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	4" LAT W/LINES (1.5/2)
Standard	NFPA 13-2016	**Drawing Reference**	SB-10
Brace Type	Lateral	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Perpendicular to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	60° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,604 lbf.

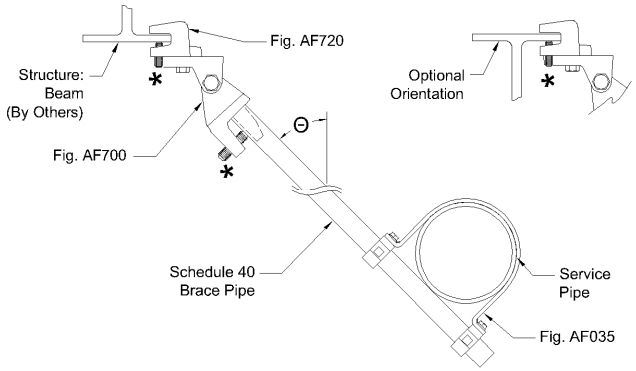
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,385 lbf.
Swivel Att.	AF700	1/2"	1,632 lbf.
Pipe Att.	AF035	4 NPS x 1 NPS	2,393 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



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Net Vertical Reaction Forces do not need to be addressed per NFPA 13-2016.

SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	4 NPS Steel Sch 40	14.00 ft.	16.40 lb/ft.	229.60 lb.	229.60 lb.
1	Branch 1	Segment A	1 1/2 NPS Steel Sch 40	200.00 ft.	3.61 lb/ft.	722.00 lb.	722.00 lb.
1	Branch 1	Riser Nipple	1 1/2 NPS Steel Sch 40	1.00 ft.	3.61 lb/ft.	3.61 lb.	3.61 lb.
1	Branch 2	Segment A	2 NPS Steel Sch 40	200.00 ft.	5.13 lb/ft.	1,026.00 lb.	1,026.00 lb.
1	Branch 2	Riser Nipple	2 NPS Steel Sch 40	1.00 ft.	5.13 lb/ft.	5.13 lb.	5.13 lb.

Weakest Main Size	Spacing	Max Fpw
4 NPS Steel Sch 40	20 ft.	2,981 lbf.

Branch	Riser Nipple	Section Mod	Fy Max	Fy
1	1 1/2 NPS Steel Sch 40	0.3260 in^3	30,000 psi	16,080 psi
2	2 NPS Steel Sch 40	0.5610 in^3	30,000 psi	13,278 psi

Total System Weight	1,986.34 lb.
System Design Weight (W_p)	2,285.00 lb.
Horizontal Seismic Load (Fpw)	1,376 lbf.

4" LAT W/LINES (2") - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	4" LAT W/LINES (2")
Standard	NFPA 13-2016	**Drawing Reference**	SB-11
Brace Type	Lateral	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Perpendicular to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

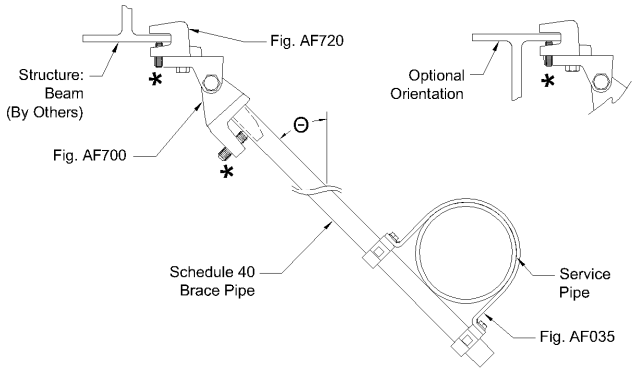
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF035	4 NPS x 1 NPS	1,955 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



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Net Vertical Reaction Forces do not need to be addressed per NFPA 13-2016.

SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	4 NPS Steel Sch 40	20.00 ft.	16.40 lb/ft.	328.00 lb.	328.00 lb.
1	Branch 1	Segment A	2 NPS Steel Sch 40	202.00 ft.	5.13 lb/ft.	1,036.26 lb.	1,036.26 lb.
1	Branch 1	Riser Nipple	2 NPS Steel Sch 40	2.00 ft.	5.13 lb/ft.	10.26 lb.	10.26 lb.

Weakest Main Size	Spacing	Max Fpw
4 NPS Steel Sch 40	20 ft.	2,981 lbf.

Branch	Riser Nipple	Section Mod	Fy Max	Fy
1	2 NPS Steel Sch 40	0.5610 in^3	30,000 psi	26,953 psi

Total System Weight	1,374.52 lb.
System Design Weight (W_p)	1,581.00 lb.
Horizontal Seismic Load (Fpw)	952 lbf.

2"LAT W/LINES - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	2"LAT W/LINES
Standard	NFPA 13-2016	**Drawing Reference**	SB-12
Brace Type	Lateral	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Perpendicular to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

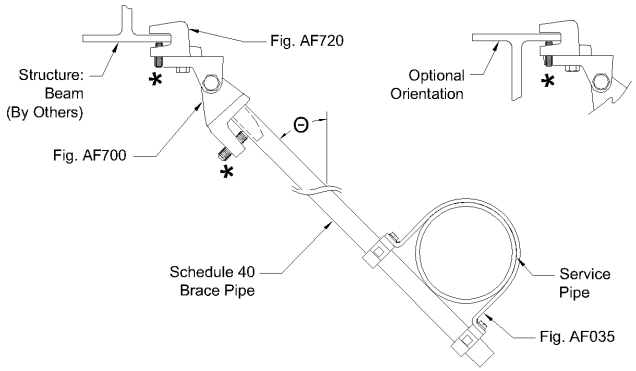
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF035	2 NPS x 1 NPS	1,955 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



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Net Vertical Reaction Forces do not need to be addressed per NFPA 13-2016.

SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	2 NPS Steel Sch 40	20.00 ft.	5.13 lb/ft.	102.60 lb.	102.60 lb.
1	Branch 1	Segment A	1 NPS Steel Sch 40	13.00 ft.	2.05 lb/ft.	26.65 lb.	26.65 lb.
1	Branch 2	Segment A	1 NPS Steel Sch 40	28.00 ft.	2.05 lb/ft.	57.40 lb.	57.40 lb.

Weakest Main Size	Spacing	Max Fpw
2 NPS Steel Sch 40	20 ft.	520 lbf.

Total System Weight	186.65 lb.
System Design Weight (W_p)	215.00 lb.
Horizontal Seismic Load (Fpw)	130 lbf.

2" LONG - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	2" LONG
Standard	NFPA 13-2016	**Drawing Reference**	SB-13
Brace Type	Longitudinal	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Parallel to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

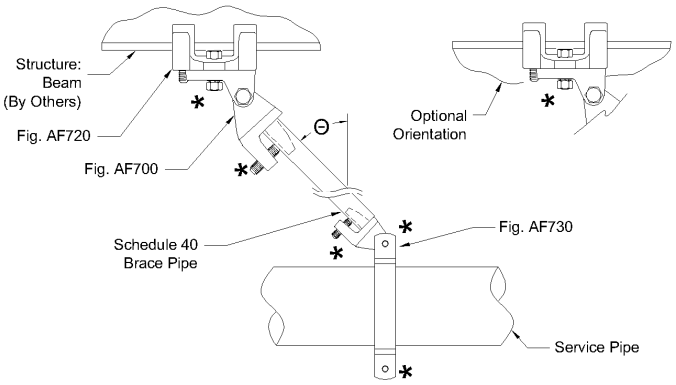
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF730	2 NPS	530 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



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Net Vertical Reaction Forces do not need to be addressed per NFPA 13-2016.

SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
C_P = 0.602

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	2 NPS Steel Sch 40	40.00 ft.	5.13 lb/ft.	205.20 lb.	205.20 lb.

Total System Weight	205.20 lb.
System Design Weight (W_p)	236.00 lb.
Horizontal Seismic Load (Fpw)	143 lbf.

2.5 LAT LONG LINES - SEISMIC BRACE CALCULATIONS

Seismic Project	PSE OTC	**Brace Name**	2.5 LAT LONG LINES
Standard	NFPA 13-2016	**Drawing Reference**	SB-14
Brace Type	Lateral	**Approval Agency**	UL Listed

STRUCTURE INFORMATION

Structure	I-Beam/Joist
Substrate	Horizontal Beam Flange
Thickness	0.19 in.-0.75 in.
Load Orientation	Perpendicular to Beam

BRACE INFORMATION

Brace Member	1 NPS Sch 40
Brace Length Max	7 ft 0 in
Brace Angle	45° - 90°
Least Radius of Gyration	0.421 in.
l/r Ratio Max	200
Max Horizontal Load	1,310 lbf.

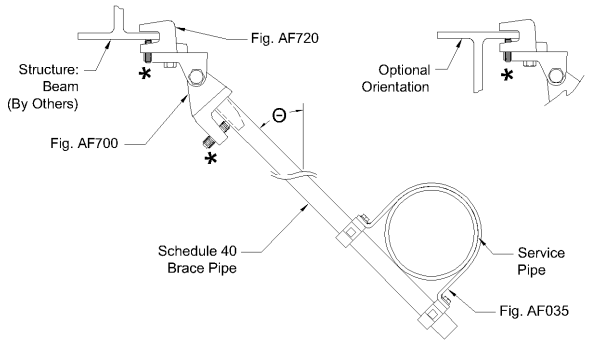
FASTENER INFORMATION

Fastener Name	N/A

SEISMIC BRACE ATTACHMENTS

	Model	Size	Adj. Load
Structural Att.	AF720	N/A	1,131 lbf.
Swivel Att.	AF700	1/2"	1,333 lbf.
Pipe Att.	AF035	2 1/2 NPS x 1 NPS	1,955 lbf.

See Appendix A for alternate seismic brace attachments.
All seismic brace attachments manufactured by ASC Engineered Solutions.



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Net Vertical Reaction Forces do not need to be addressed per NFPA 13-2016.

SPRINKLER SYSTEM LOAD CALCULATION ($F_{PW} = C_P * W_P$)
$C_P = 0.602$

Qty	Line	Description	Pipe Size/Type	Length	Weight/ft	Weight/Line	Total Weight
1	Main	Braced Pipe	2 1/2 NPS Steel Sch 40	18.00 ft.	7.89 lb/ft.	142.02 lb.	142.02 lb.
1	Branch 1	Segment A	1 1/2 NPS Steel Sch 40	81.00 ft.	3.61 lb/ft.	292.41 lb.	292.41 lb.
1	Branch 1	Segment B	1 NPS Steel Sch 40	30.00 ft.	2.05 lb/ft.	61.50 lb.	61.50 lb.
1	Branch 1	Riser Nipple	1 1/2 NPS Steel Sch 40	2.00 ft.	3.61 lb/ft.	7.22 lb.	7.22 lb.
1	Branch 2	Segment A	1 1/2 NPS Steel Sch 40	89.00 ft.	3.61 lb/ft.	321.29 lb.	321.29 lb.
1	Branch 2	Riser Nipple	1 1/2 NPS Steel Sch 40	2.00 ft.	3.61 lb/ft.	7.22 lb.	7.22 lb.

Weakest Main Size	Spacing	Max Fpw
2 1/2 NPS Steel Sch 40	20 ft.	984 lbf.

Branch	Riser Nipple	Section Mod	Fy Max	Fy
1	1 1/2 NPS Steel Sch 40	0.3260 in^3	30,000 psi	16,005 psi
2	1 1/2 NPS Steel Sch 40	0.3260 in^3	30,000 psi	14,560 psi

Total System Weight	831.66 lb.
System Design Weight (W_p)	957.00 lb.
Horizontal Seismic Load (Fpw)	577 lbf.

Appendix A - Alternate Seismic Brace Attachments

6" BULK LAT

Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF735 6 NPS x 1 NPS | 1,333 lbf.
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF775 6 NPS x 1 NPS | 1,131 lbf.
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	AF730 6 NPS | 1,333 lbf.
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--
AF772	Type A	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type A	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF087	--	990 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF087	--	990 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	1,425 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF086	--	1,425 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--

6" BULK LONG

Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF775 6 NPS x 1 NPS | 1,131 lbf.
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--

6" LAT W/LINES (1.5)

Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF735 6 NPS x 1 NPS | 1,333 lbf.
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF775 6 NPS x 1 NPS | 1,131 lbf.
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	AF730 6 NPS | 1,333 lbf.
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--
AF772	Type A	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type A	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF086	--	1,425 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF086	--	1,425 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--

6" LAT W/LINES (2.5)

Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF735 6 NPS x 1 NPS | 1,333 lbf.
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF775 6 NPS x 1 NPS | 1,131 lbf.
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	AF730 6 NPS | 1,333 lbf.
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--
AF772	Type A	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type A	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF086	--	1,425 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF086	--	1,425 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--

2.5" LAT W/LINES (1.5)

Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF001 2 1/2 NPS x 1 NPS | 707 lbf.
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF735 2 1/2 NPS x 1 NPS | 1,333 lbf.
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF775 2 1/2 NPS x 1 NPS | 707 lbf.
AF778	--	707 lbf.	AF700 1/2" | 1,333 lbf.	AF730 2 1/2 NPS | 770 lbf.
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--
AF772	Type A	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type B	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type A	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF772	Type B	707 lbf.	AF700 1/2" | 1,333 lbf.	--
AF087	--	990 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF087	--	990 lbf.	AF076 1/2" | 1,955 lbf.	--
AF087	--	990 lbf.	AF077 1 NPS x 1/2" | 707 lbf.	--
AF086	--	1,425 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF086	--	1,425 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	1,425 lbf.	AF077 1 NPS x 1/2" | 707 lbf.	--
AF086	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--

2.5" LONG

Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF775 2 1/2 NPS x 1 NPS | 707 lbf.
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF778	--	707 lbf.	AF700 1/2" | 1,333 lbf.	--
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--
AF772	Type A	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type B	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type A	707 lbf.	AF700 1/2" | 1,333 lbf.	--
AF772	Type B	707 lbf.	AF700 1/2" | 1,333 lbf.	--
AF087	--	990 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF087	--	990 lbf.	AF076 1/2" | 1,955 lbf.	--
AF087	--	990 lbf.	AF077 1 NPS x 1/2" | 707 lbf.	--
AF086	--	894 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF086	--	894 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	894 lbf.	AF077 1 NPS x 1/2" | 707 lbf.	--
AF086	--	894 lbf.	AF700 1/2" | 1,333 lbf.	--

6" LAT W/LINES (2/1.5)

Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF735 6 NPS x 1 NPS | 1,333 lbf.
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF775 6 NPS x 1 NPS | 1,131 lbf.
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	AF730 6 NPS | 1,333 lbf.
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--
AF772	Type A	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type A	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF087	--	990 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF087	--	990 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	1,425 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF086	--	1,425 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--

4" LAT

Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF001 4 NPS x 1 NPS | 707 lbf.
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF735 4 NPS x 1 NPS | 1,333 lbf.
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF775 4 NPS x 1 NPS | 707 lbf.
AF778	--	707 lbf.	AF700 1/2" | 1,333 lbf.	AF730 4 NPS | 1,333 lbf.
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--
AF772	Type A	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type B	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type A	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF772	Type B	707 lbf.	AF700 1/2" | 1,333 lbf.	--
AF087	--	990 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF087	--	990 lbf.	AF076 1/2" | 1,955 lbf.	--
AF087	--	990 lbf.	AF077 1 NPS x 1/2" | 707 lbf.	--
AF086	--	1,425 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF086	--	1,425 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	1,425 lbf.	AF077 1 NPS x 1/2" | 707 lbf.	--
AF086	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--

4" LONG

Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--
AF087	--	990 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF087	--	990 lbf.	AF076 1/2" | 1,955 lbf.	--

4" LAT W/LINES (1.5/2)

Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	1,385 lbf.	AF771 1 NPS x 1/2" | 3,238 lbf.	AF735 4 NPS x 1 NPS | 1,632 lbf.
AF778	--	1,744 lbf.	AF771 1 NPS x 1/2" | 3,238 lbf.	AF730 4 NPS | 1,632 lbf.
AF778	--	1,385 lbf.	AF700 1/2" | 1,632 lbf.	--
AF778	--	1,744 lbf.	AF700 1/2" | 1,632 lbf.	--
AF720	--	1,385 lbf.	AF771 1 NPS x 1/2" | 3,238 lbf.	--
AF727	--	1,632 lbf.	AF727 1/2" | 1,632 lbf.	--
AF720	--	1,385 lbf.	AF076 1/2" | 2,393 lbf.	--
AF772	Type A	1,385 lbf.	AF771 1 NPS x 1/2" | 3,238 lbf.	--
AF772	Type A	1,385 lbf.	AF700 1/2" | 1,632 lbf.	--
AF086	--	1,744 lbf.	AF075 1 NPS x 1/2" | 1,744 lbf.	--
AF086	--	1,744 lbf.	AF076 1/2" | 2,393 lbf.	--
AF086	--	1,744 lbf.	AF700 1/2" | 1,632 lbf.	--

4" LAT W/LINES (2")

Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF735 4 NPS x 1 NPS | 1,333 lbf.
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF730 4 NPS | 1,333 lbf.
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--
AF772	Type A	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type A	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF087	--	990 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF087	--	990 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	1,425 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF086	--	1,425 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--

2"LAT W/LINES

Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF001 2 NPS x 1 NPS | 707 lbf.
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF730 2 NPS | 530 lbf.
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF778	--	707 lbf.	AF700 1/2" | 1,333 lbf.	--
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--
AF772	Type A	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type B	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type A	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF772	Type B	707 lbf.	AF700 1/2" | 1,333 lbf.	--
AF087	--	990 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF087	--	990 lbf.	AF076 1/2" | 1,955 lbf.	--
AF087	--	990 lbf.	AF077 1 NPS x 1/2" | 707 lbf.	--
AF086	--	1,425 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF086	--	1,425 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	1,425 lbf.	AF077 1 NPS x 1/2" | 707 lbf.	--
AF086	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--

2" LONG

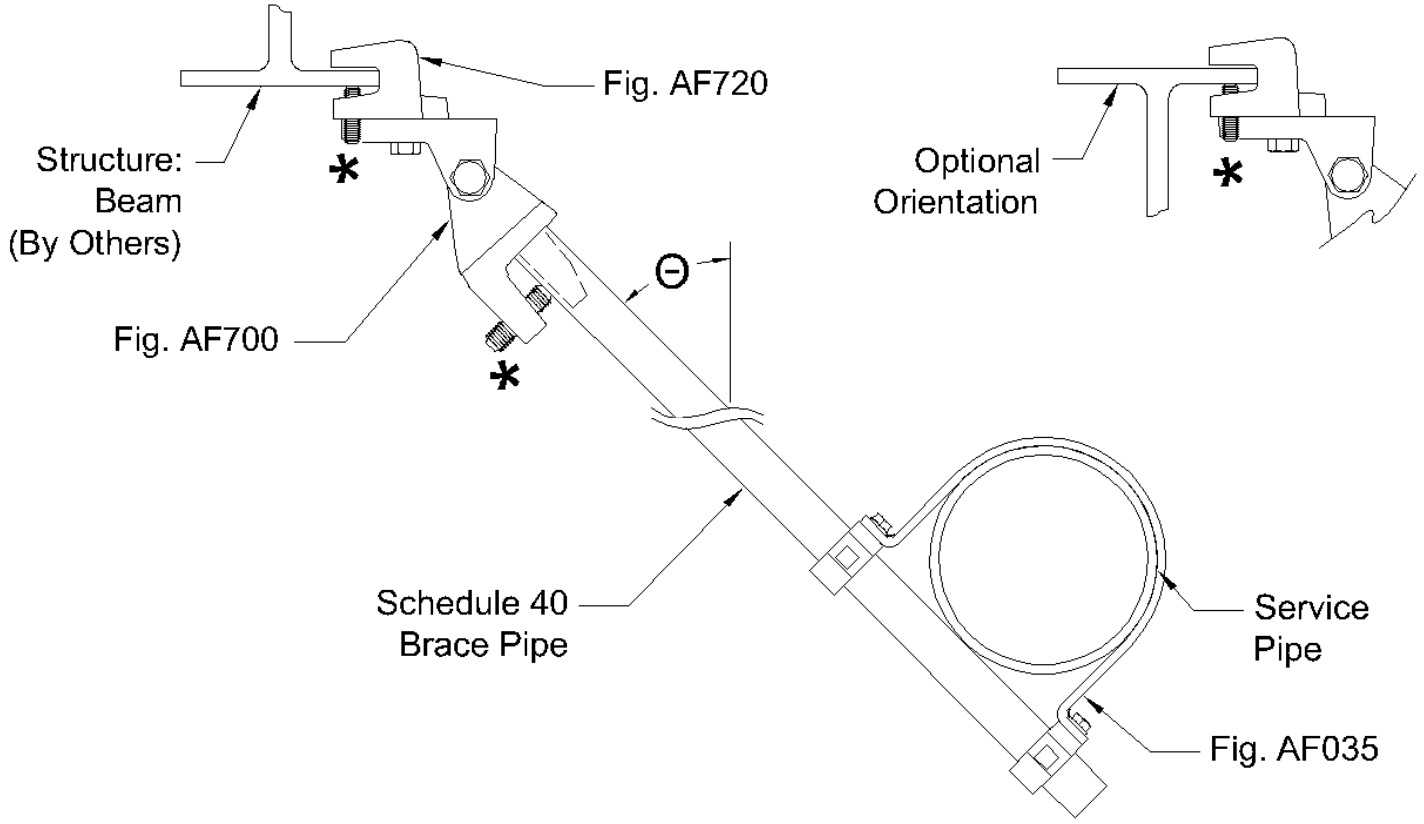
Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF778	--	707 lbf.	AF700 1/2" | 1,333 lbf.	--
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--
AF772	Type A	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type B	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type A	707 lbf.	AF700 1/2" | 1,333 lbf.	--
AF772	Type B	707 lbf.	AF700 1/2" | 1,333 lbf.	--
AF087	--	990 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF087	--	990 lbf.	AF076 1/2" | 1,955 lbf.	--
AF087	--	990 lbf.	AF077 1 NPS x 1/2" | 707 lbf.	--
AF086	--	894 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF086	--	894 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	894 lbf.	AF077 1 NPS x 1/2" | 707 lbf.	--
AF086	--	894 lbf.	AF700 1/2" | 1,333 lbf.	--

2.5 LAT LONG LINES

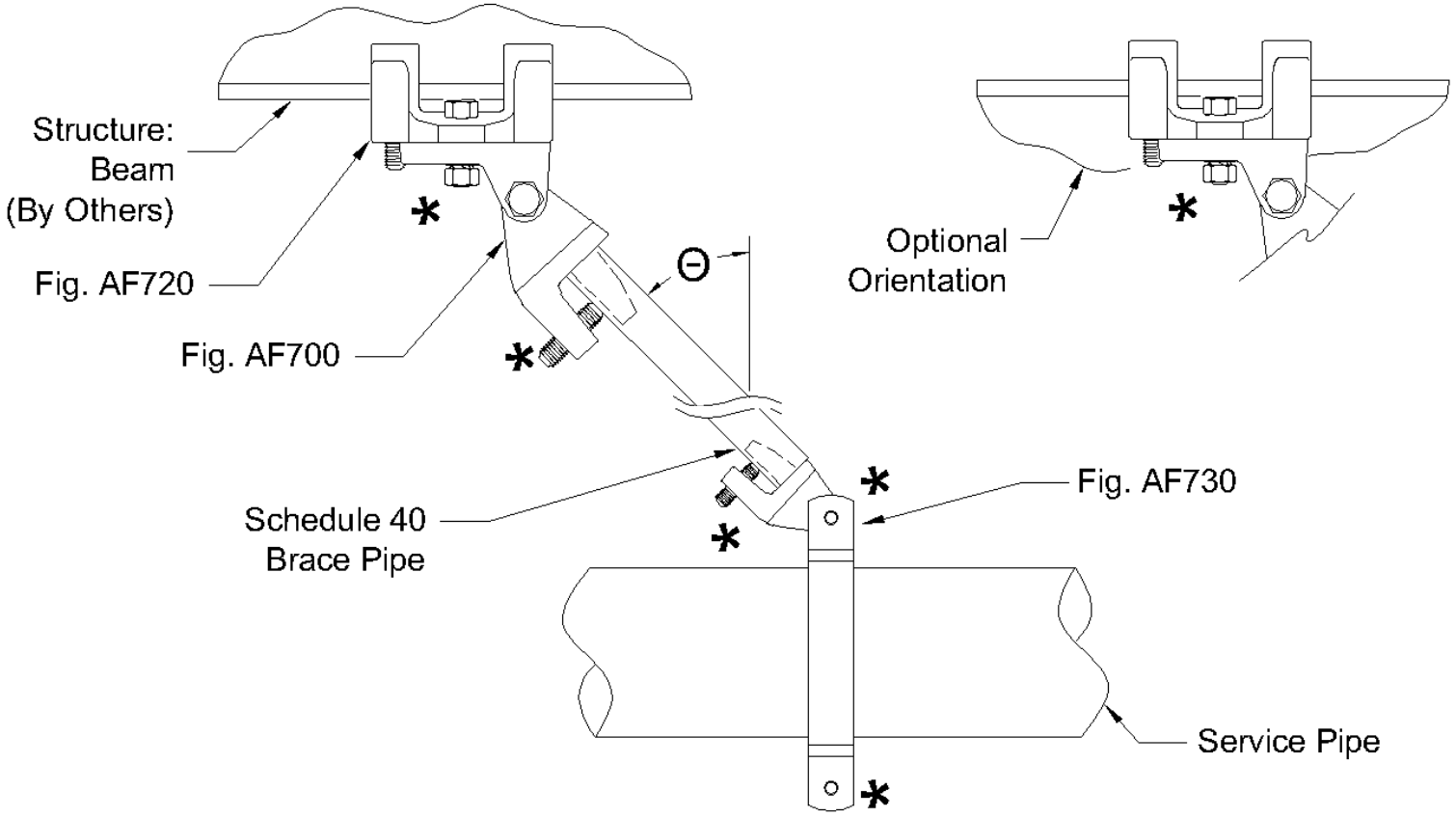
Structural Attachment	Structural Attach. Size	Structural Attach. Capacity	Swivel	Pipe Attachment
AF778	--	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF001 2 1/2 NPS x 1 NPS | 707 lbf.
AF778	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF735 2 1/2 NPS x 1 NPS | 1,333 lbf.
AF778	--	1,425 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	AF775 2 1/2 NPS x 1 NPS | 707 lbf.
AF778	--	707 lbf.	AF700 1/2" | 1,333 lbf.	AF730 2 1/2 NPS | 770 lbf.
AF778	--	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF778	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF727	--	1,333 lbf.	AF727 1/2" | 1,333 lbf.	--
AF720	--	1,131 lbf.	AF076 1/2" | 1,955 lbf.	--
AF772	Type A	1,131 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type B	707 lbf.	AF771 1 NPS x 1/2" | 2,644 lbf.	--
AF772	Type A	1,131 lbf.	AF700 1/2" | 1,333 lbf.	--
AF772	Type B	707 lbf.	AF700 1/2" | 1,333 lbf.	--
AF087	--	990 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF087	--	990 lbf.	AF076 1/2" | 1,955 lbf.	--
AF087	--	990 lbf.	AF077 1 NPS x 1/2" | 707 lbf.	--
AF086	--	1,425 lbf.	AF075 1 NPS x 1/2" | 1,425 lbf.	--
AF086	--	1,425 lbf.	AF076 1/2" | 1,955 lbf.	--
AF086	--	1,425 lbf.	AF077 1 NPS x 1/2" | 707 lbf.	--
AF086	--	1,425 lbf.	AF700 1/2" | 1,333 lbf.	--

Appendix B - Enlarged Images

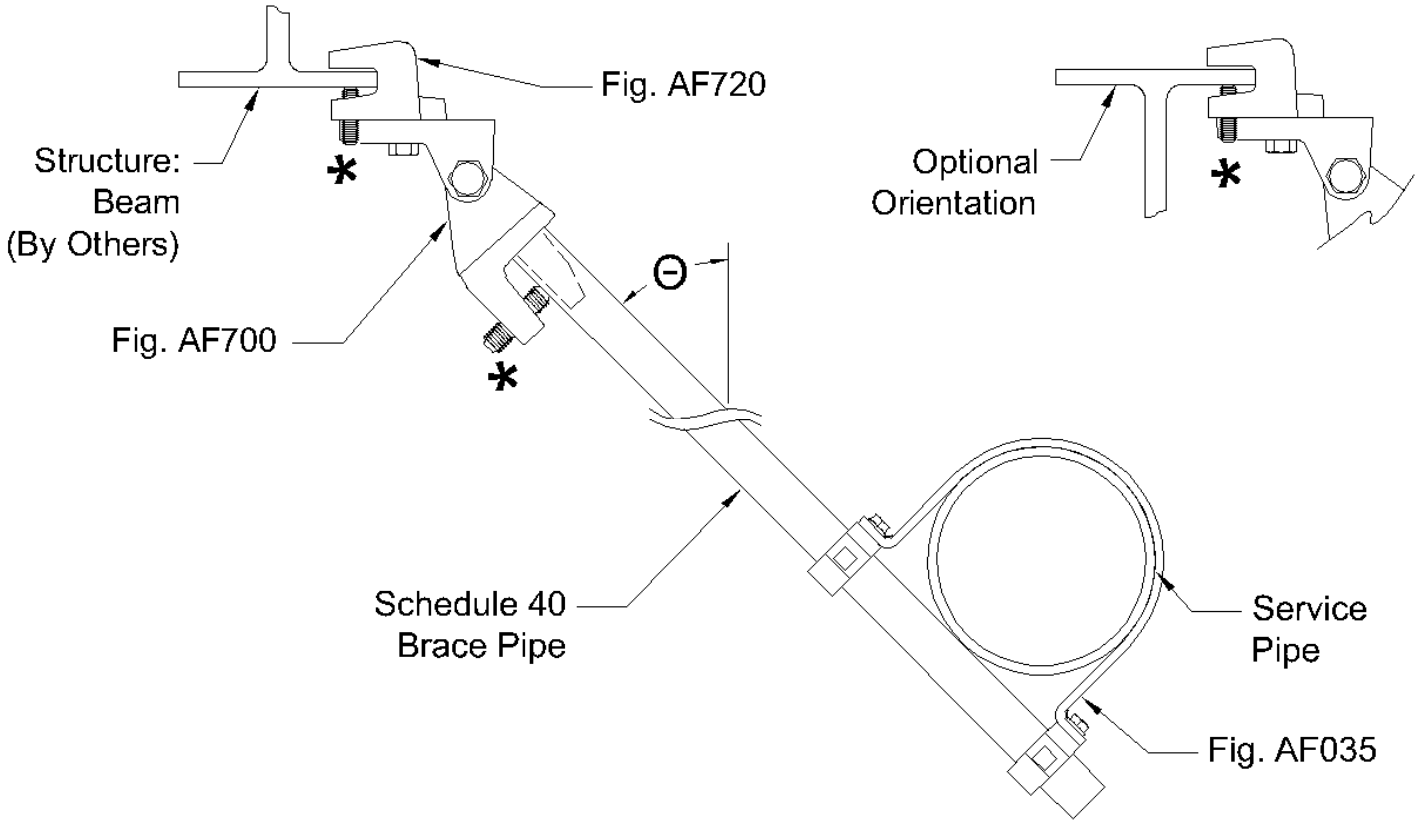
6" BULK LAT



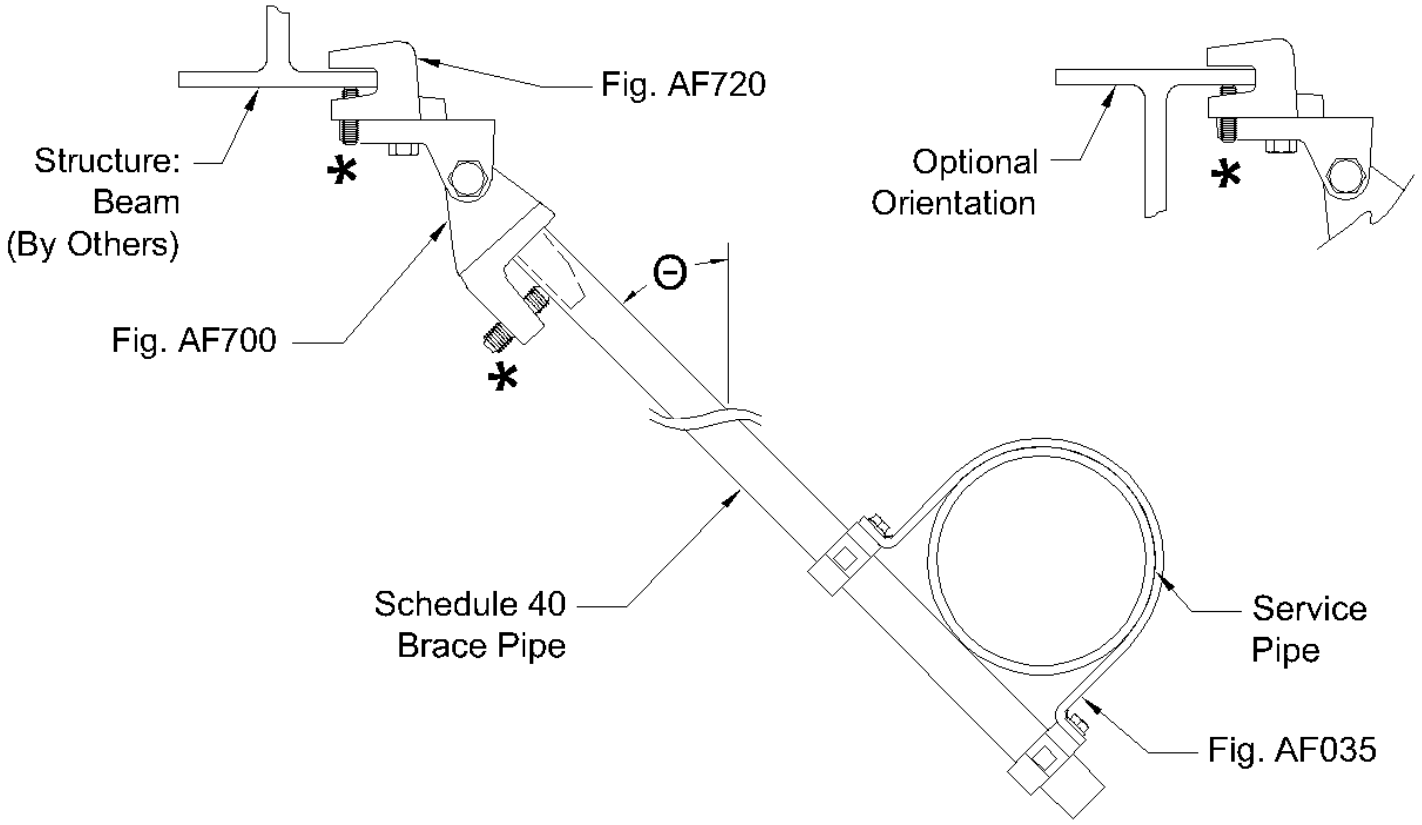
6" BULK LONG



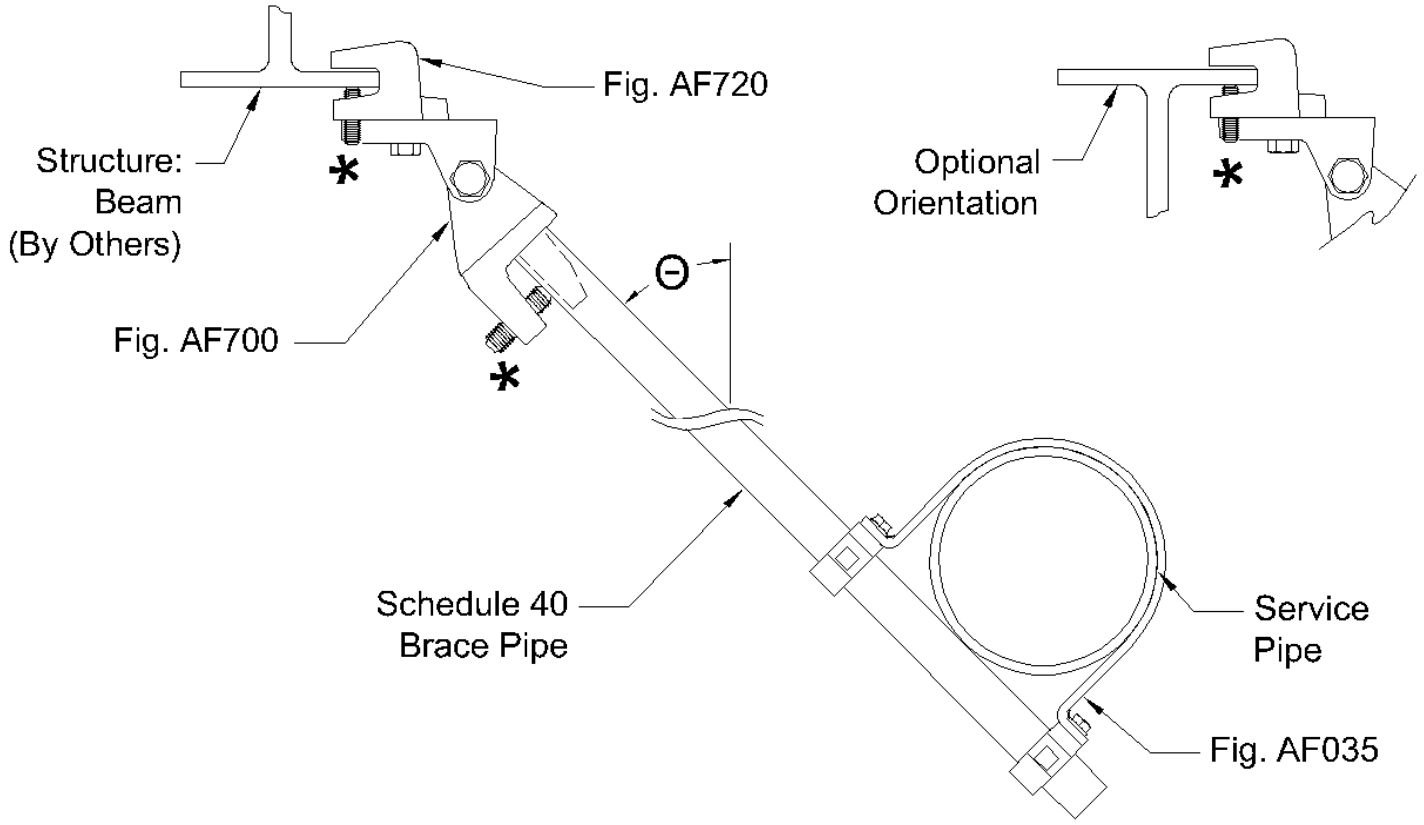
6" LAT W/LINES (1.5)



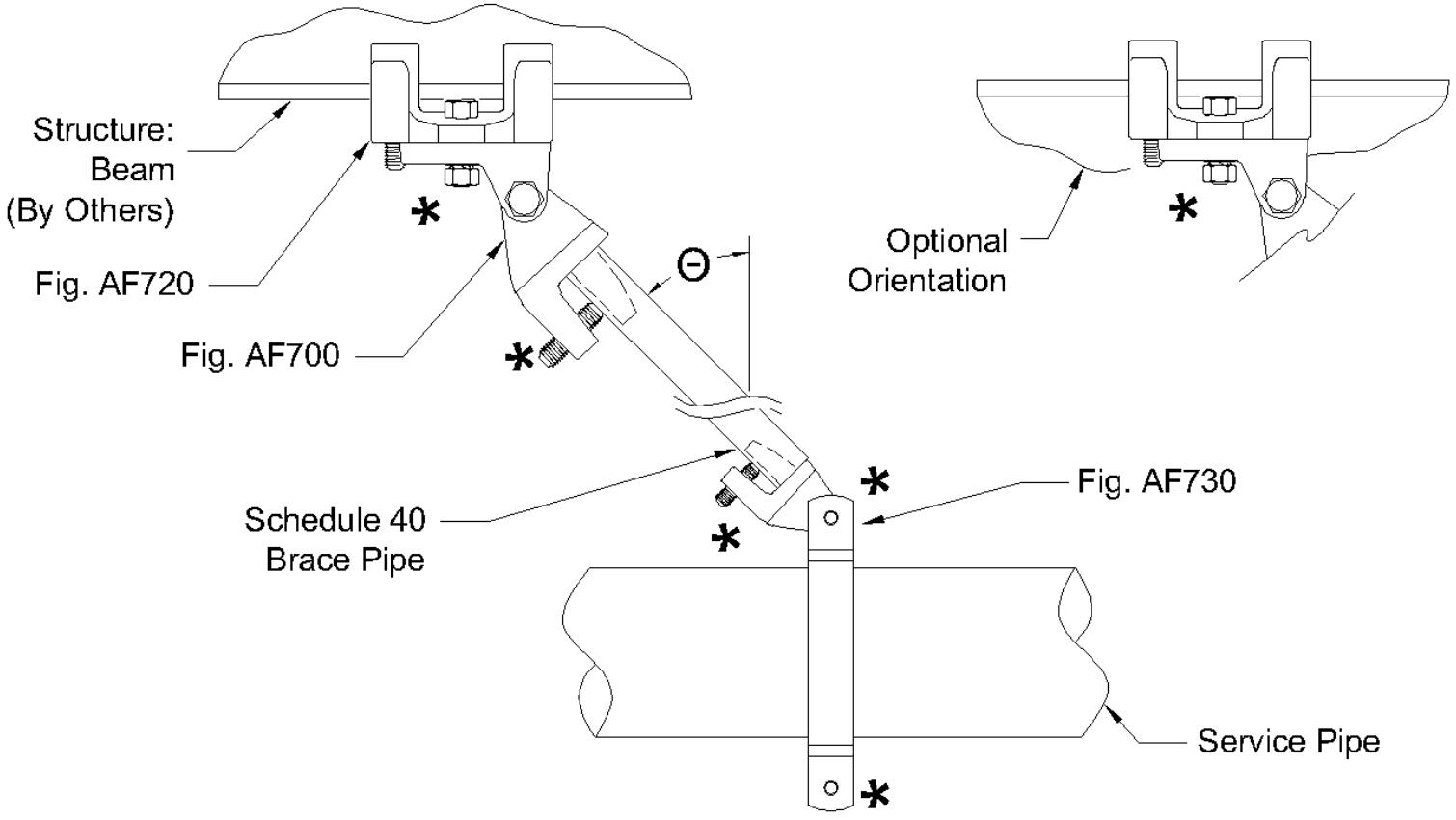
6" LAT W/LINES (2.5)



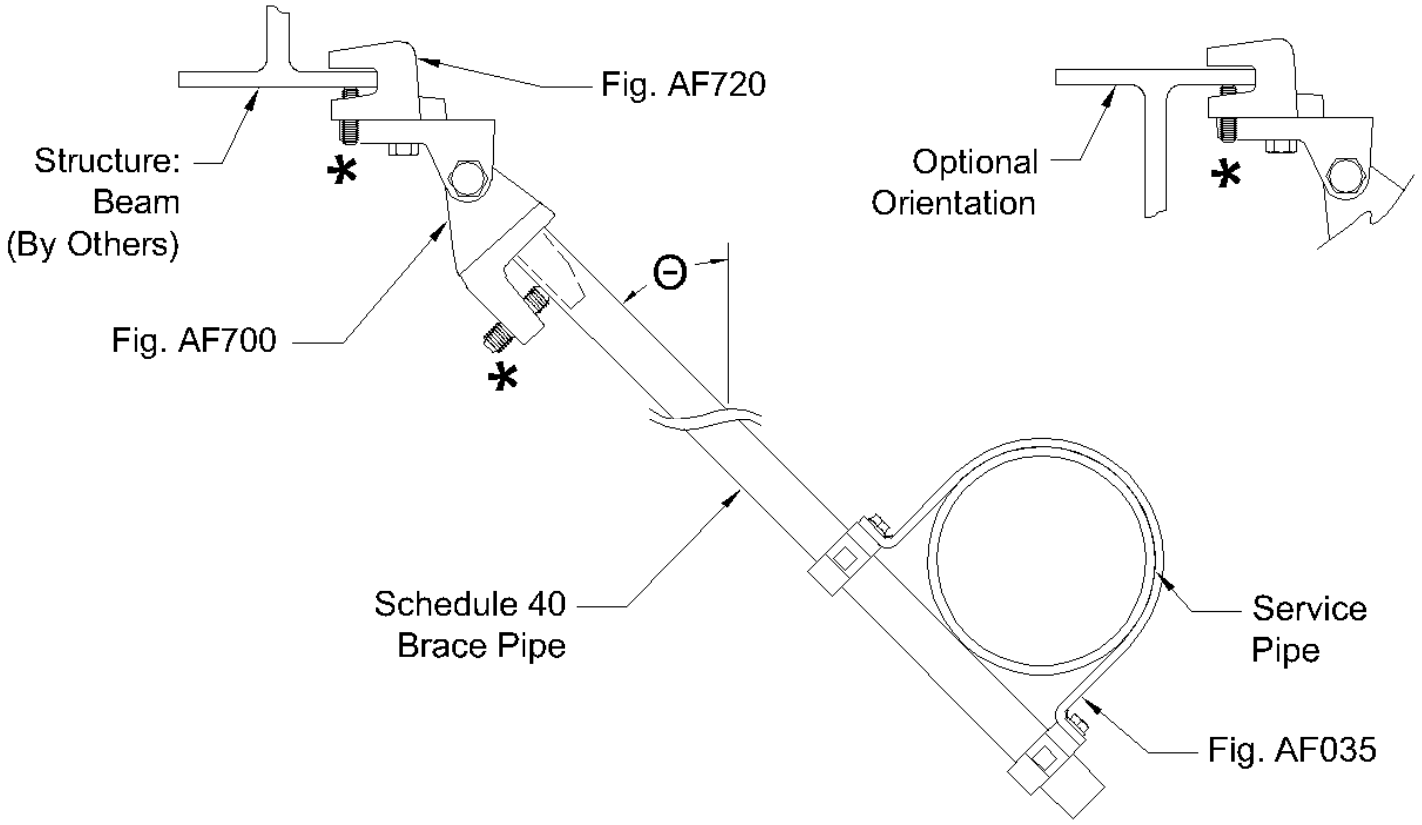
2.5" LAT W/LINES (1.5)



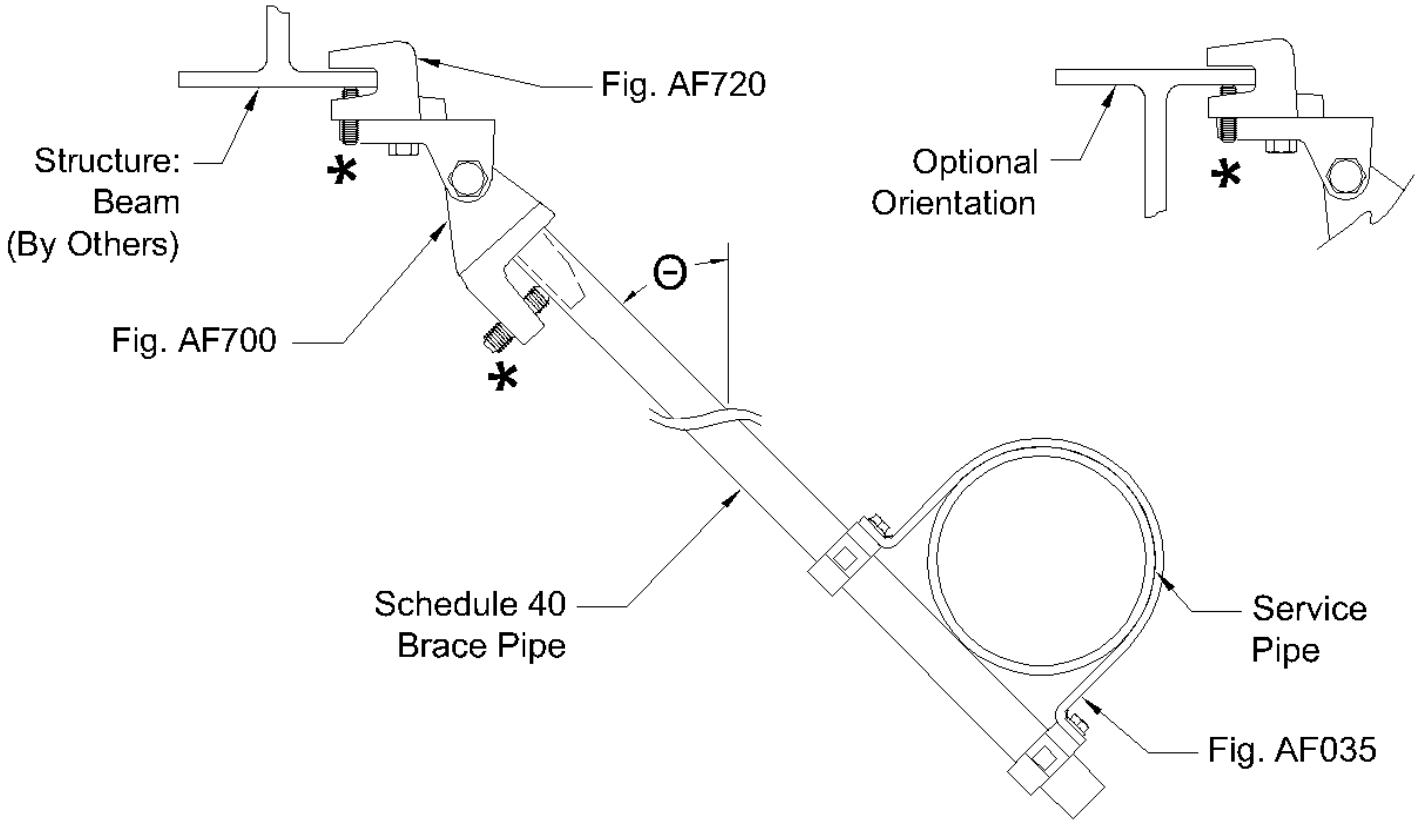
2.5" LONG



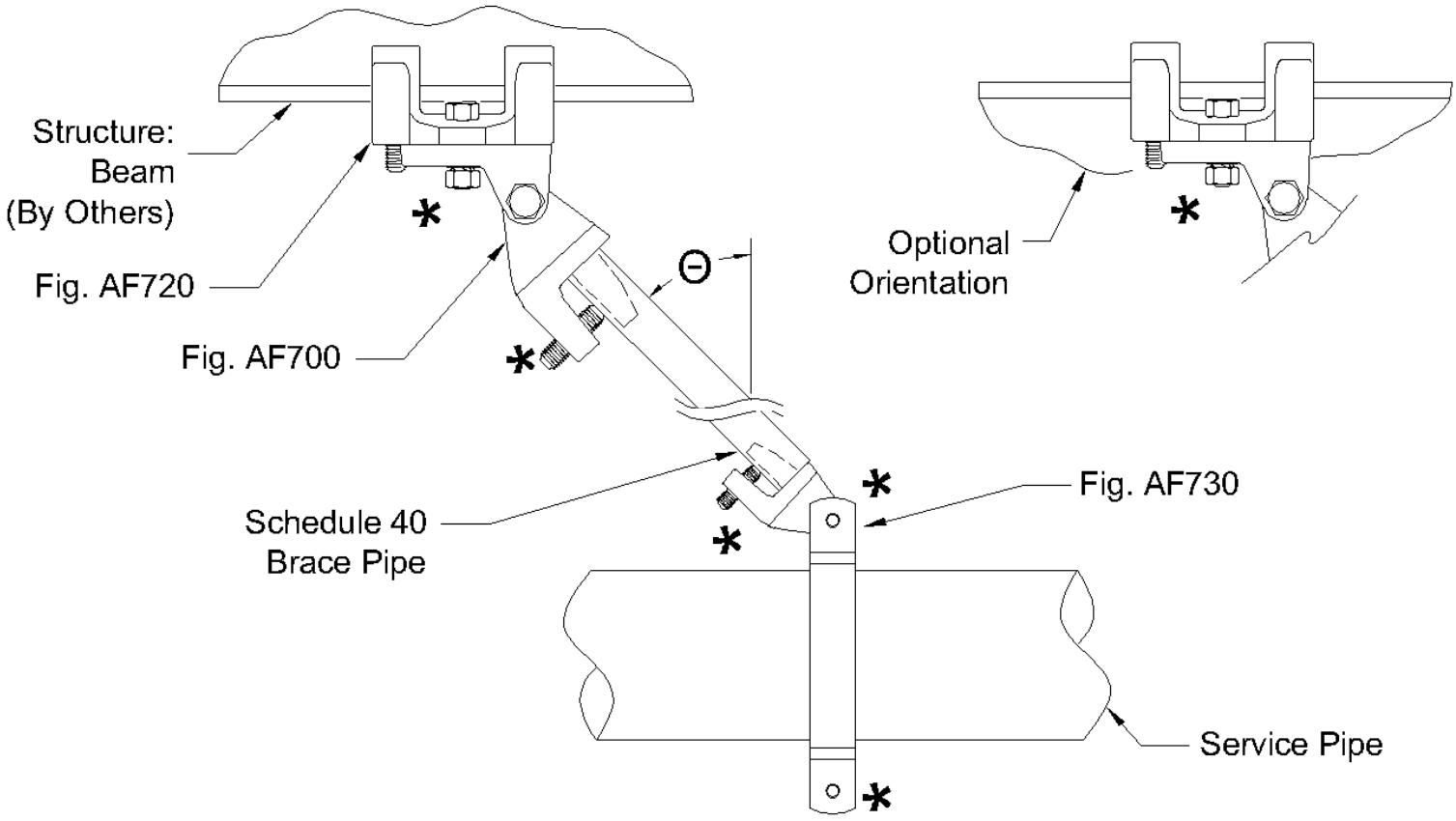
6" LAT W/LINES (2/1.5)



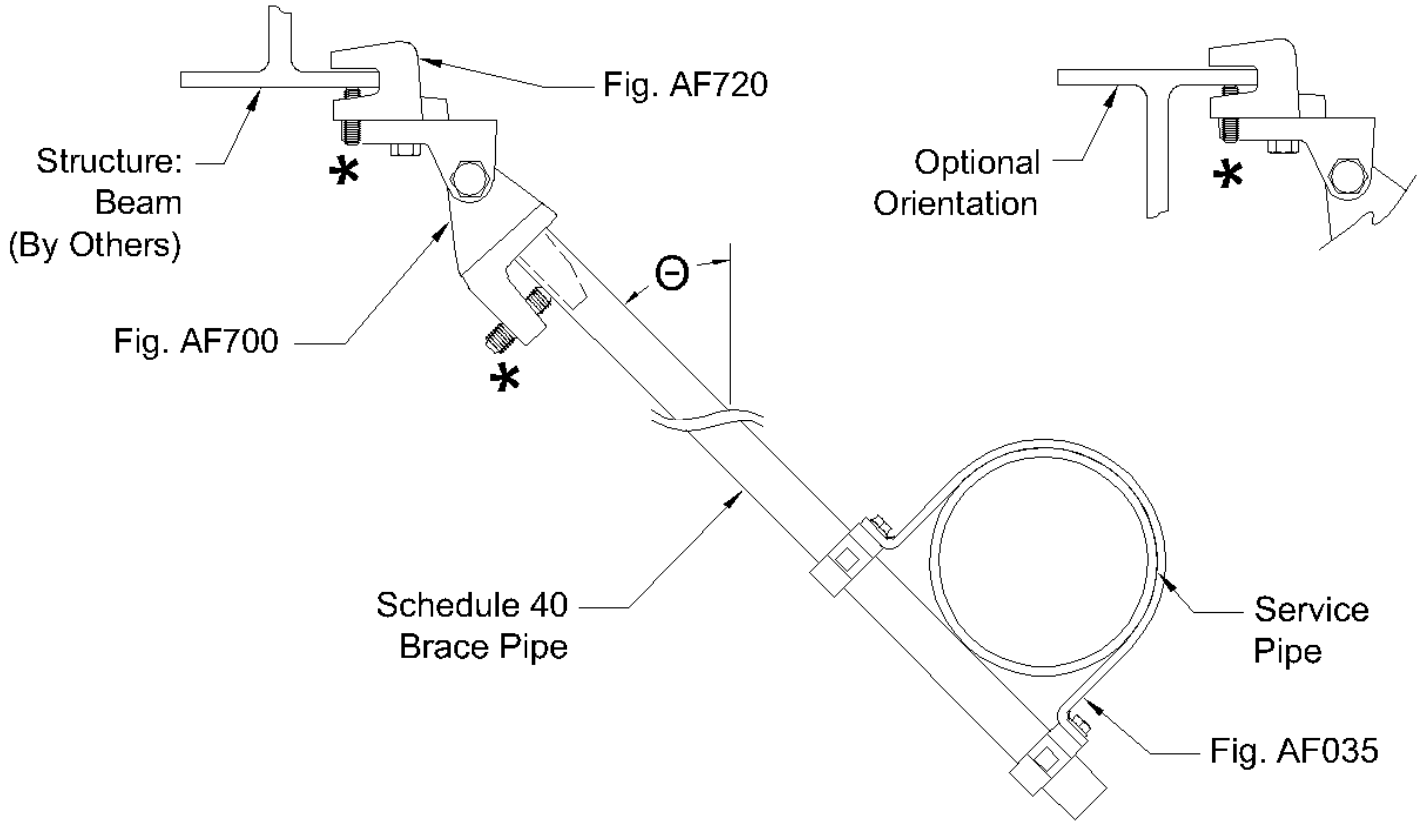
4" LAT



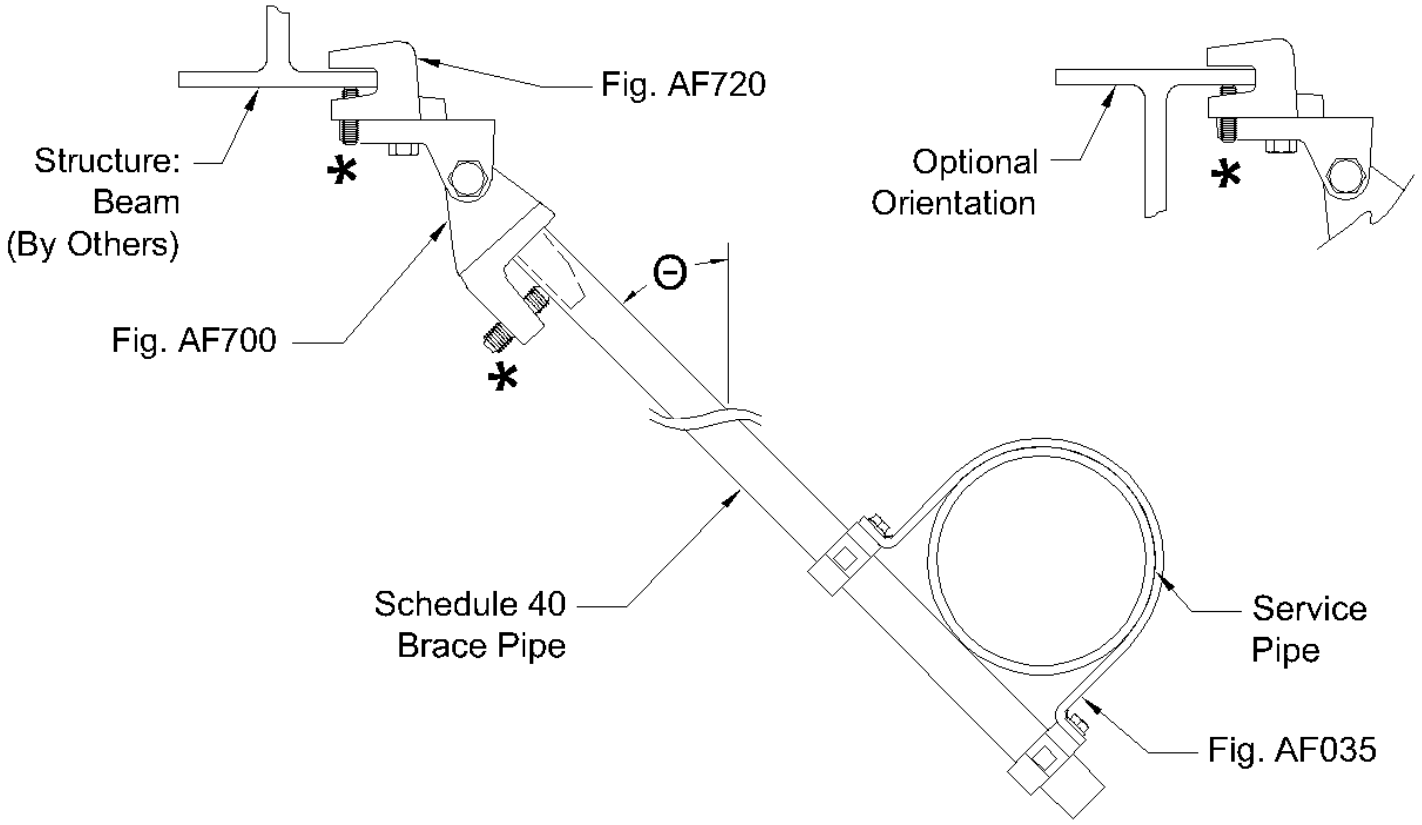
4" LONG



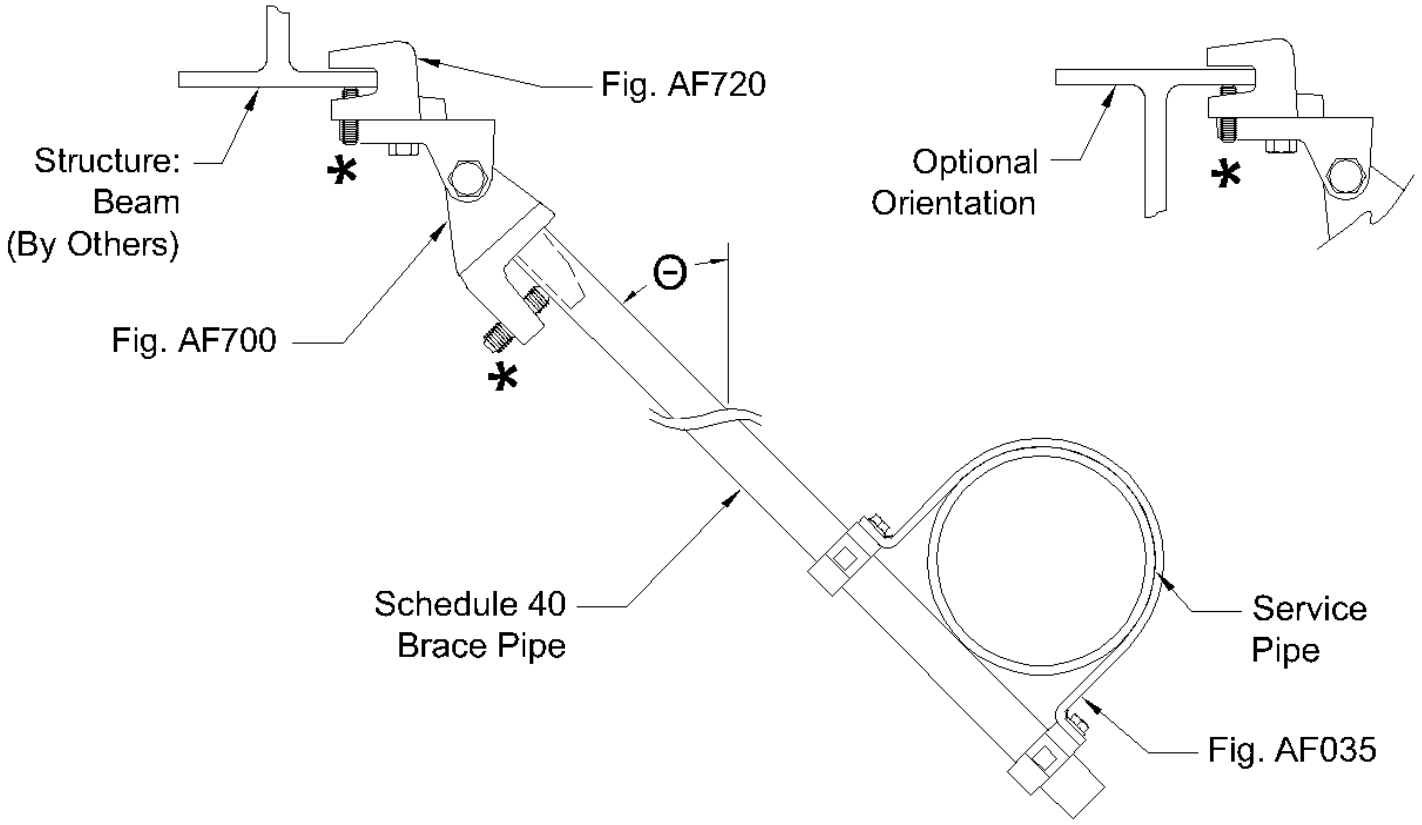
4" LAT W/LINES (1.5/2)



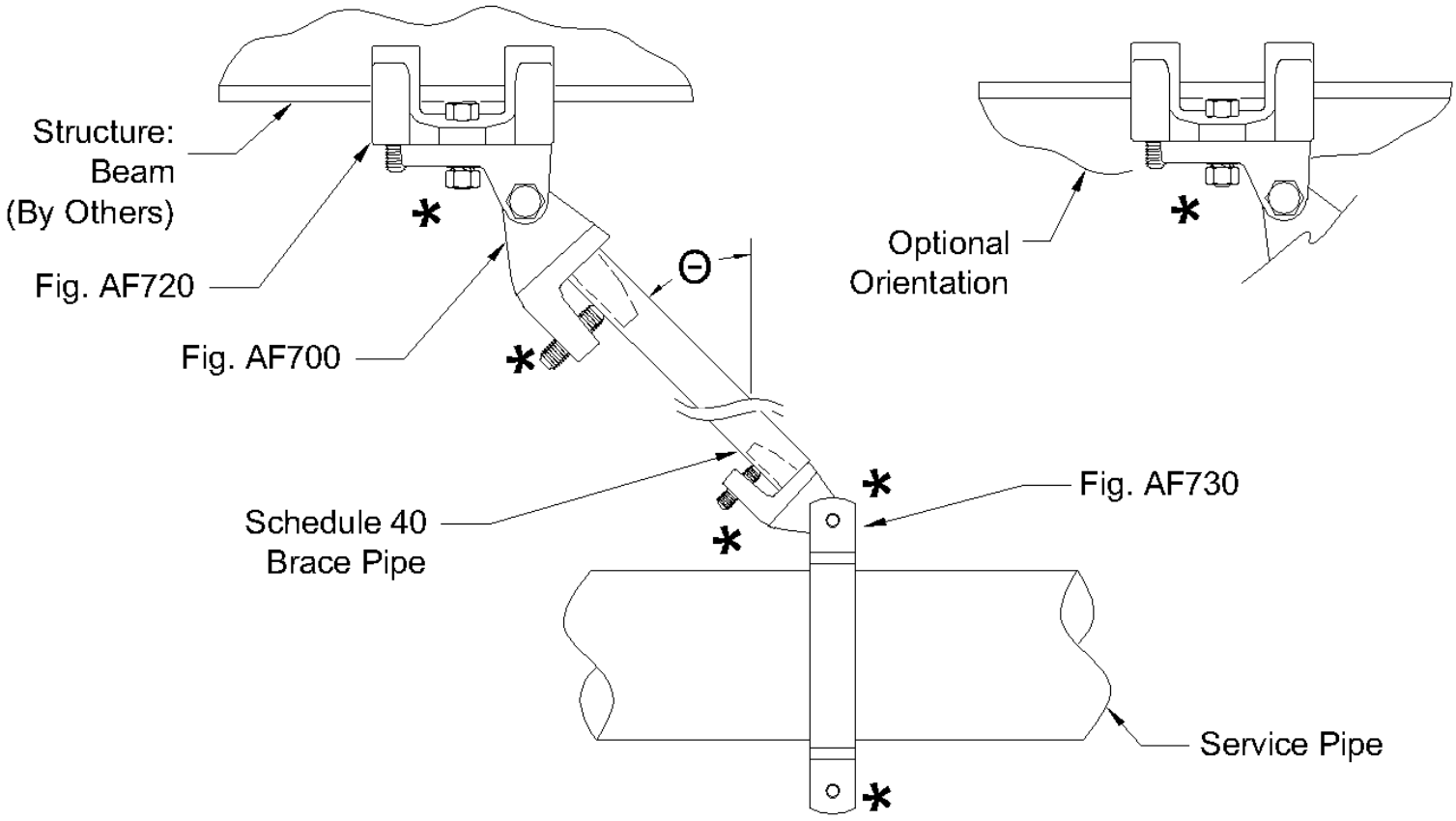
4" LAT W/LINES (2")



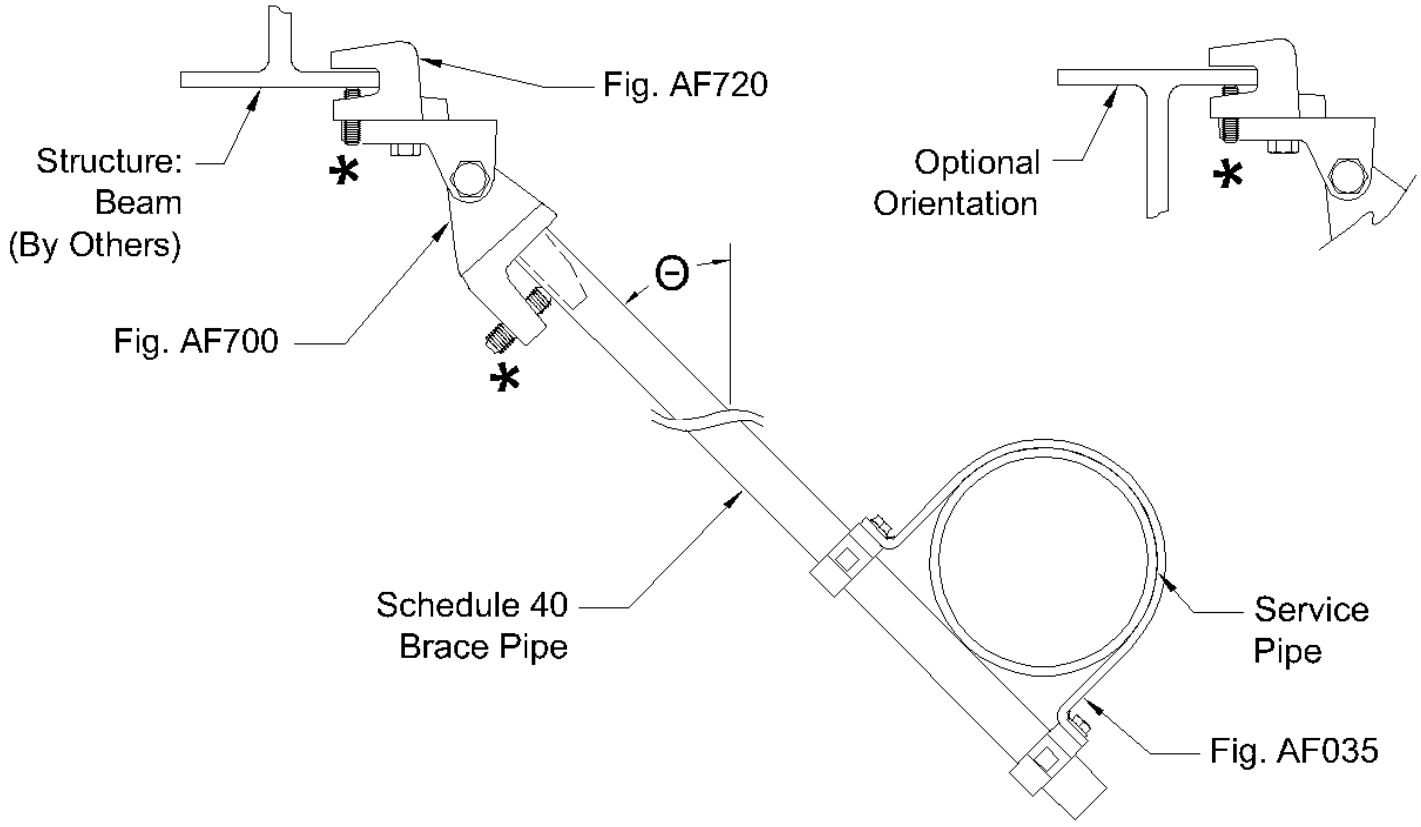
2"LAT W/LINES



2" LONG



2.5 LAT LONG LINES



** - denotes hardware shown with the bolt head or nut broken off, as per the product installation instructions*

Appendix C - C_p Calculations

BRACE CALCULATION DATA

Brace Name	Brace Ref	Method	C_p	S_s	Site	F_a	S_{DS}	Z	H
6" BULK LAT	SB-01	A	0.602	1.277	--	--	--	--	--
6" BULK LONG	SB-02	A	0.602	1.277	--	--	--	--	--
6" lat w/lines (1.5)	SB-03	A	0.602	1.277	--	--	--	--	--
6" lat w/lines (2.5)	SB-04	A	0.602	1.277	--	--	--	--	--
2.5" LAT W/LINES (1.5)	SB-05	A	0.602	1.277	--	--	--	--	--
2.5" LONG	SB-06	A	0.602	1.277	--	--	--	--	--
6" LAT W/LINES (2/1.5)	SB-07	A	0.602	1.277	--	--	--	--	--
4" LAT	SB-08	A	0.602	1.277	--	--	--	--	--
4" LONG	SB-09	A	0.602	1.277	--	--	--	--	--
4" LAT W/LINES (1.5/2)	SB-10	A	0.602	1.277	--	--	--	--	--
4" LAT W/LINES (2")	SB-11	A	0.602	1.277	--	--	--	--	--
2"LAT W/LINES	SB-12	A	0.602	1.277	--	--	--	--	--
2" LONG	SB-13	A	0.602	1.277	--	--	--	--	--
2.5 LAT LONG LINES	SB-14	A	0.602	1.277	--	--	--	--	--

CALCULATION METHODS

A	C_p calculated per NFPA 13-2016 Table 9.3.5.9.3
B	C_p entered by user
C	C_p calculated per ASCE/SEI 7-10 per NFPA 13-2016 Section 9.3.5.9.4

LEGEND

F_{pw}	Seismic Horizontal Design Force
C_p	Seismic Coefficient per NFPA
S_s	Short Period MCEr Spectral Response Acceleration
F_a	Site Coefficient. See Tables Below.
S_{DS}	Short Period Spectral Acceleration
a_p	Component Amplification Factor. Taken as 2.5 for Fire Sprinkler Applications
R_p	Component Response Modification Factor. Taken as 4.5 for Fire Sprinkler Applications
I_p	Component Importance Factor. Taken as 1.5 for Fire Sprinkler Applications
W_p	Component Operating Weight. Taken as the weight of the Fire Sprinkler System in the ZOI plus 15%
z	Height in the structure where the component attaches to the structure. Height is relative to the base of the structure and shall not be taken as less than 0 and shall not be larger than “H”.
H	Average roof height of the structure relative to the base

EQUATIONS...

$$F_{pw} = C_p W_p$$

$$Where: C_p = 0.7 * \frac{0.4 a_p S_{DS} I_p}{R_p}\left(1 + 2\frac{Z}{H}\right)$$

$$Where: S_{DS} = {}^{2}/_{3}\, F_a S_s$$

$$C_{p\,max} = 0.7 * 1.6 S_{DS} I_p$$

$$C_{p\,min} = 0.7 * 0.3 S_{DS} I_p$$

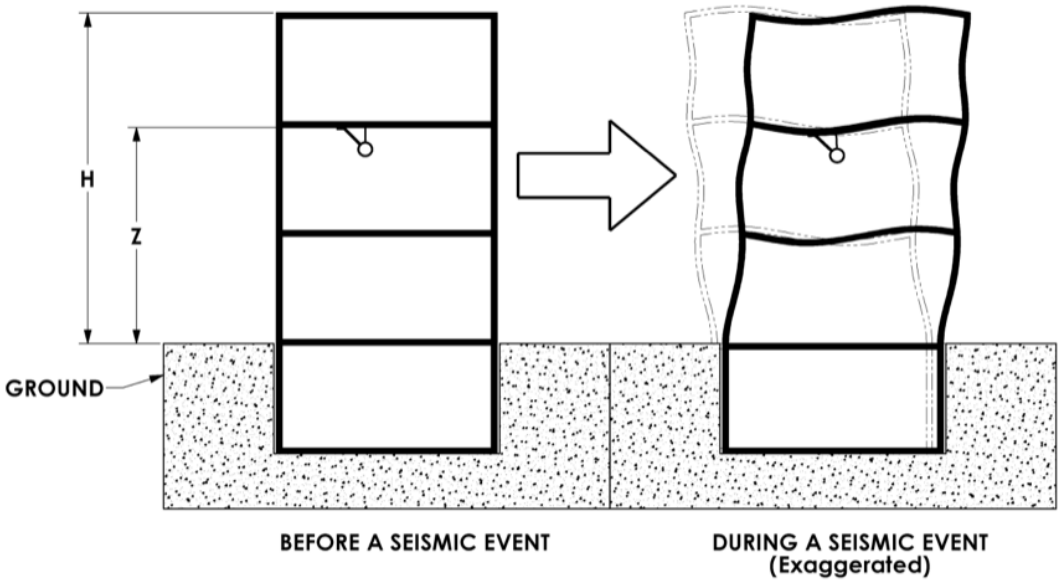
SITE COEFFICIENT, F_A PER ASCE/SEI 7-10

	$S_s \leq 0.25$	$S_s = 0.5$	$S_s = 0.75$	$S_s = 1$	$S_s \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1	1	1	1	1
C	1.2	1.2	1.1	1	1
D	1.6	1.4	1.2	1.1	1
E	2.5	1.7	1.2	0.9	0.9

Use straight-line interpolation for intermediate values of S_s.

SITE CLASSIFICATION PER ASCE/SEI 7-10

Site Class	Ground Structure
A	Hard Rock
B	Rock
C	Very Dense Soil and Soft Rock
D	Stiff Soil
E	Soft Clay Soil



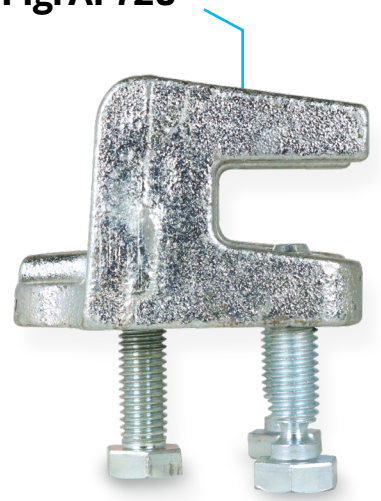
Appendix D - Bill of Materials

Project Name PSE OTC
Code Requirements NFPA 13-2016
Last Updated November 4, 2024

QUANTITY	FIGURE NUMBER	PRODUCT	DESCRIPTION
14			Fastener
14	AF720	AF720 Universal Structural Seismic Brace Attachment	AF720
14	AF700	1/2" AF700 Universal Swivel Attachment	AF700 - 1/2"
4	AF035	6 NPS AF035 Model K Brace Clamp	AF035 - 6 NPS x 1 NPS
1	AF730	6 NPS AF730 Longitudinal & Lateral Seismic Clamp	AF730 - 6 NPS
2	AF035	2 1/2 NPS AF035 Model K Brace Clamp	AF035 - 2 1/2 NPS x 1 NPS
1	AF730	2 1/2 NPS AF730 Longitudinal & Lateral Seismic Clamp	AF730 - 2 1/2 NPS
3	AF035	4 NPS AF035 Model K Brace Clamp	AF035 - 4 NPS x 1 NPS
1	AF730	4 NPS AF730 Longitudinal & Lateral Seismic Clamp	AF730 - 4 NPS
1	AF035	2 NPS AF035 Model K Brace Clamp	AF035 - 2 NPS x 1 NPS
1	AF730	2 NPS AF730 Longitudinal & Lateral Seismic Clamp	AF730 - 2 NPS

ASC Engineered Solutions

Universal Structural Brace Attachment
Fig. AF720



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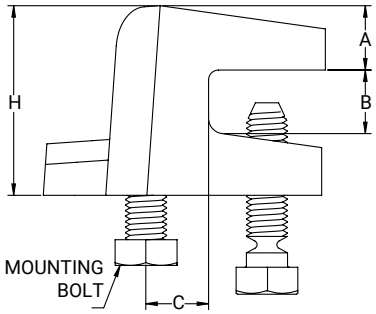
FM APPROVED



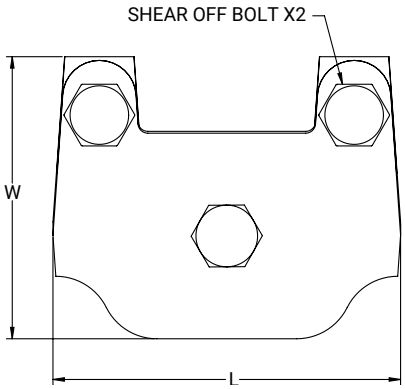


FIG. AF720: Dimensions and Weights

Mounting Bolt Size (diam.)	A	B	L	W	H	Weight
	In./mm	In./mm	In./mm	In./mm	In./mm	Lbs/kg
½	0.78 (19.8)	0.75 (19.1)	4.22 (107.2)	3.43 (87)	2.31 (58.7)	3.28 (1.49)

Notes:

ASC Engineered Solutions™ brand bracing components are designed to be compatible ONLY with other ASC Engineered Solutions brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

Material Specifications

Size Range
Flange Thickness: 0.06"– ¾"

Material
Ductile Iron with Carbon Steel Hardware

Finish
☐ Plain
☐ Electro-Galvanized per ASTM B633

Service
A seismic structural attachment designed to attach to steel I-beams, steel columns and joists. The AF720 rigidly braces piping systems subjected to horizontal and vertical seismic loads.

Approvals
cULus Listed (ANSI/UL 203a) & FM Approved (FM 1950-13). Complies with NFPA 13, ASCE 7, IBC, & MSS SP-127 bracing requirements.

Features
- The set screw provides a visual indication that proper installation has been achieved
- May be used as an acceptable alternative to the Fig. AF778 in all applications
- May be installed anywhere a Fig 92 standard throat beam clamp may be installed.
- Includes all hardware needed for installation to structure and to swivel attachment

Ordering
Specify figure number, åfinish, and description.

Disclaimer:

ASC Engineered Solutions does not provide any warranties and specifically disclaims any liability whatsoever with respect to ASC bracing products and components that are used in combination with products, parts or systems not manufactured or sold by ASC. In no event shall ASC be liable for any incidental, direct, consequential, special or indirect damages or lost profits where non-ASC bracing components have been, or are used.

Seis Brace® Seismic Fire Protection Design Tool may be accessed at www.seisbrace.com

AFCON
An ASC Engineered Solution

PROJECT INFORMATION	APPROVAL STAMP
Project: PSE OTC	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	Remarks:
Submittal Date: May 23, 2024	
Notes 1:	
Notes 2:	

ASC Engineered Solutions

Universal Structural Brace Attachment
Fig. AF720

FIG. AF720 cULus Listing per ANSI/UL 203a (ASD) with AF700

Structure	Load Orientation	Horizontal Load Rating at Brace Angle			
		30°-44°	45°-59°	60°-90°	Listed
		Lbf/(kN)	Lbf/(kN)	Lbf/(kN)	Lbf/kN
Horizontal Steel Flange and Vertical Steel Flange	Parallel to Flange Perpendicular to Flange	942 (4.19)	1333 (5.93)	1632 (7.26)	1885 (8.38)

1) Listed for installation with Fig. AF700
2) Brace Angles are determined from Vertical.
3) Listed load ratings reduced for angle ranges in accordance with NFPA 13-2019 Table 18.5.2.3.
4) Minimum safety factor of 2.2 in accordance with NFPA 13-2019 Section A.18.5.2.3.

FIG. AF720 cULus Listing per ANSI/UL 203a (ASD) with AF771 or AF076

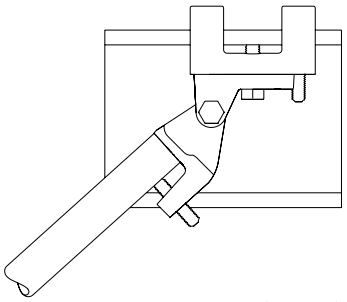
Structure	Load Orientation	Horizontal Load Rating at Brace Angle			
		30°-44°	45°-59°	60°-90°	Listed
		Lbf/(kN)	Lbf/(kN)	Lbf/(kN)	Lbf/kN
Horizontal Steel Flange and Vertical Steel Flange	Parallel to Flange Perpendicular to Flange	800 (3.56)	1131 (5.03)	1385 (6.16)	1600 (7.12)

1) Listed for installation with Fig. AF771, and AF076
2) Brace Angles are determined from Vertical.
3) Listed load ratings reduced for angle ranges in accordance with NFPA 13-2019 Table 18.5.2.3.
4) Minimum safety factor of 2.2 in accordance with NFPA 13-2019 Section A.18.5.2.3.

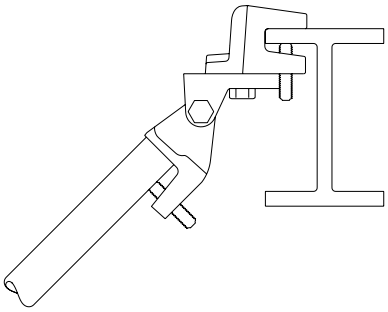
FIG. AF720 FM Approved (Listing) per FM 1950-13 (ASD)

Structure	Load Orientation	Flange Thickness	Horizontal Load Rating at Brace Angle			
			30°-44°	45°-59°	60°-74°	75°-90°
		In./(mm)	Lbf/(kN)	Lbf/(kN)	Lbf/(kN)	Lbf/kN
Horizontal Steel Flange	Parallel to Flange	0.125–0.750 (3.18–19.05)	1280 (5.69)	1840 (8.18)	2210 (9.83)	2470 (10.99)
	Perpendicular to Flange		1570 (6.98)	1490 (6.63)	1040 (4.63)	1150 (5.12)
Vertical Steel Flange	Parallel to Flange		870 (3.87)	1440 (6.41)	1230 (5.47)	1360 (6.05)
	Perpendicular to Flange		1038 (4.58)	2260 (10.05)	2490 (11.08)	2750 (12.23)

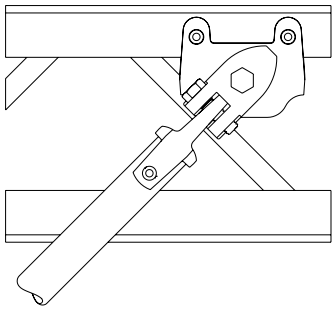
1) Listed for installation with Fig. AF700 & AF771
2) Brace Angles are determined from Vertical.
3) Listed load ratings reduced for angle ranges in accordance with NFPA 13-2019 Table 18.5.2.3.
4) Minimum safety factor of 1.5 in accordance with NFPA 13-2016 Section A.9.3.5.2.3. To convert the load ratings above to a safety factor of 2.2 per NFPA 13-2019 Section A.18.5.2.3, multiply load ratings by a factor of 0.68.
5) To convert to LRFD Load Ratings, ASD Load Ratings may be multiplied by a factor of 1.5.



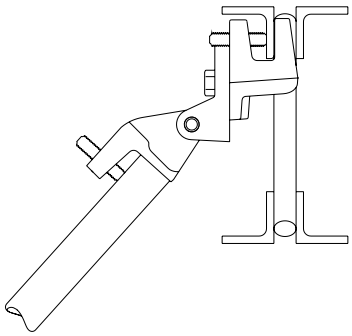
Horizontal Steel Flange (I-Beam)
Seismic Load Parallel to the Flange



Horizontal Steel Flange (I-Beam)
Seismic Load Perpendicular to the Flange



Vertical Steel Flange (Joist)
Seismic Load Parallel to the Flange



Vertical Steel Flange (Joist)
Seismic Load Perpendicular to the Flange

Installation Instructions

1. Place the AF720 on a horizontal or vertical steel flange.
2. Hand tighten the set screws until they contact the flange. Continue to torque the set screws until the heads break off.
3. Mount the AF700, AF771, or AF076 to the ½" mounting bolt. The mounting bolt shall be installed wrench tight (typically finger tight plus ¼ to ½ turns).

Note: When installed with the AF700, AF771, or AF076, the lowest load rating at angle shall control the load rating of the assembly.

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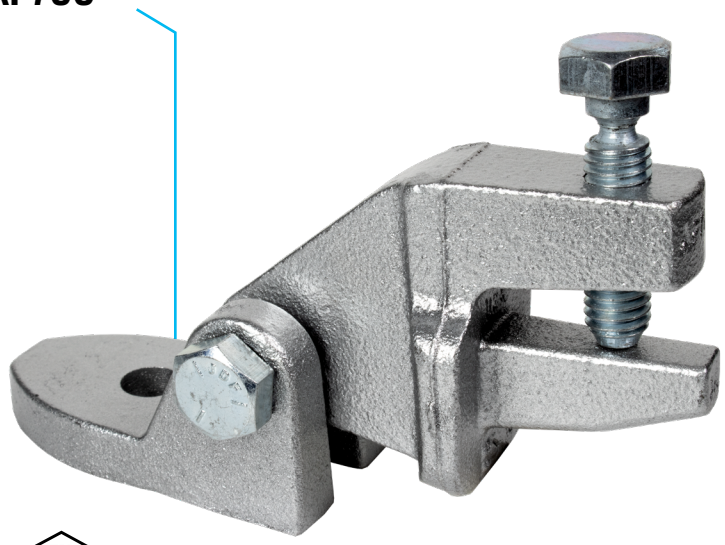
Universal Swivel Attachment
Fig. AF700



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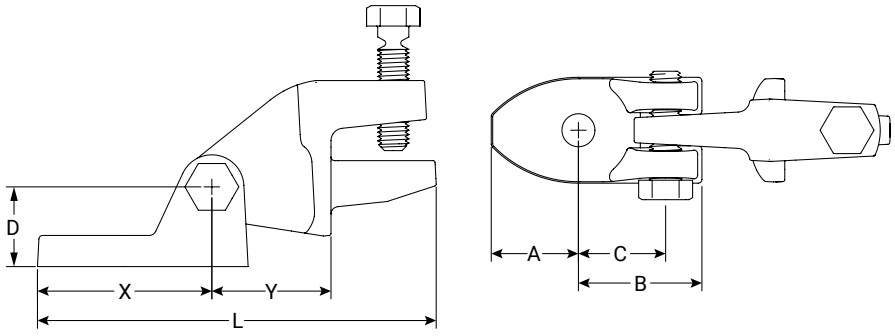

FIG. AF700 Dimensions and Weight

A	B	C	D	L	X	Y	Weight
In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	lbs/kgs
1.40 35.56	1.983 50.37	1.400 35.56	1.280 32.51	6.40 162.6	2.80 71.1	1.91 48.5	2.25 1.02

Notes:

ASC Engineered Solutions™ brand bracing components are designed to be compatible ONLY with other ASC Engineered Solutions brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

Material Specifications

Size Range
Brace Member: See Table
Anchors: ½"- ¾" (M12—M18)

Material
Ductile Iron with Carbon Steel Hardware

Finish
☐ Plain
☐ Electro-Galvanized per ASTM B633

Service
A seismic swivel attachment designed to connect a brace member to the building structure or to a seismic structural attachment. The AF700 rigidly braces piping systems subjected to horizontal and vertical seismic loads.

Approvals
cULus Listed (ANSI/UL 203a)), FM Approved (FM 1950-13), & FM Tested (FM 1950-16). FM Tested (ANSI/FM 1950-16). Complies with NFPA 13, ASCE 7, IBC, & MSS SP-127 bracing requirements.

Features
- The set screw provides a visual indication that proper installation has been achieved
- Eliminates brace member eccentricity by concentrically loading 1" and 1 ¼" brace pipes

Ordering
Specify figure number, fastener size, finish and description.

Disclaimer:

ASC Engineered Solutions does not provide any warranties and specifically disclaims any liability whatsoever with respect to ASC bracing products and components that are used in combination with products, parts or systems not manufactured or sold by ASC. In no event shall ASC be liable for any incidental, direct, consequential, special or indirect damages or lost profits where non-ASC bracing components have been, or are used.

Seis Brace® Seismic Fire Protection Design Tool may be accessed at www.seisbrace.com

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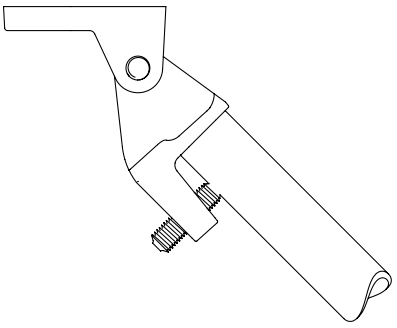
PROJECT INFORMATION	APPROVAL STAMP
Project: PSE OTC	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	Remarks:
Submittal Date: May 23, 2024	
Notes 1:	
Notes 2:	

Universal Swivel Attachment
Fig. AF700

FIG. AF700 cULus Listing per ANSI/UL 203a (ASD)

Brace Member	Fastener Size	Horizontal Load Rating at Brace Angle			
		30°- 44°	45°- 59°	60°- 90°	Listed
1" – 2" Sch 40 Pipe (DN25 – DN50)	½"- ¾" (M12-M18)	942 lbf (4.19 kN)	1333 lbf (5.93 kN)	1632 lbf (7.26 kN)	1885 lbf (8.38 kN)

1) Load ratings may apply to NPFA 13 fastener orientations A, B, C, D, E, F, G, H, or I.
2) Brace Angles are determined from Vertical.
3) Listed load ratings reduced for angle ranges in accordance with NFPA 13-2019 Table 18.5.2.3.
4) See table below for listed brace members.
5) Minimum safety factor of 2.2 in accordance with NFPA 13-2019 Section A.18.5.2.3.

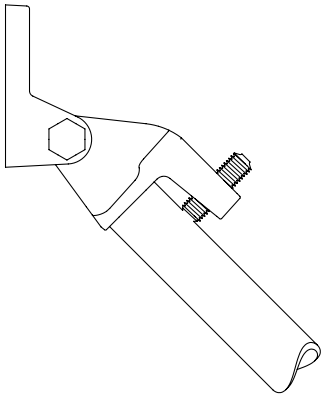


NFPA 13 Orientations A, B, or C

FIG. AF700 FM Approved (Listing) per FM 1950-13 (ASD)

Brace Member	Fastener Size	Horizontal Load Rating at Brace Angle			
		30°-44°	45°-59°	60°-74°	74°-90°
1" – 2" Sch 40 Pipe (DN25 – DN50)	½"- ¾" (M12-M18)	1780 lbf (7.92 kN)	2510 lbf (11.17 kN)	3080 lbf (13.70 kN)	3440 lbf (15.30 kN)

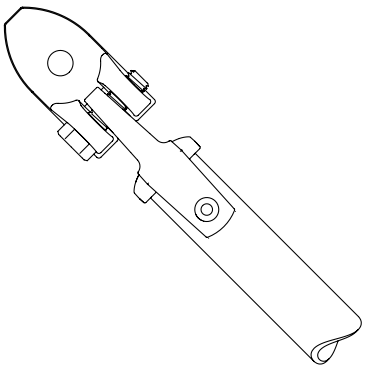
1) Load ratings may apply to NPFA 13 fastener orientations A, B, C, D, E, F, G, H, or I.
2) Brace Angles are determined from Vertical.
3) Listed load ratings reduced for angle ranges in accordance with NFPA 13-2019 Table 18.5.2.3.
4) See table below for listed brace members.
5) Minimum safety factor of 1.5 in accordance with NFPA 13-2016 Section A.9.3.5.2.3. To convert the load ratings above to a safety factor of 2.2 per NFPA 13-2019 Section A.18.5.2.3, multiply load ratings by a factor of 0.68.
6) To convert to LRFD Load Ratings, ASD Load Ratings may be multiplied by a factor of 1.5.



NFPA 13 Orientations D, E, or F

FIG. AF700 FM Listed, Approved & Tested Brace Members

Brace Member	Brace Size	Standard (or Equivalent)	UL	FM
Sch. 40 NPS Pipe	1", 1¼", 1½", 2"	ASTM A53, A106,A135, or A795	✓	✓
Sch. 40 Metric Pipe	DN25	KS S 3562	✓	✓
	DN32	EN10255H		✓
Metric Pipe	DN40	GB/T 3091		✓
	DN50	JIS G3454		✓



NFPA 13 Orientations G, H, or I

FIG AF700 Horizontal Prying Factors (Pr) Per NFPA 13: Angles (Deg)

Fastener Orientation	A	B	C	D	E	F	G	H	I
Brace Angle	30°-44°	45°-59°	60°-90°	30°-44°	45°-59°	60°-90°	30°-44°	45°-59°	60°-90°
AF700	2.55	1.09	0.91	1.41	1.45	2.00	1.83	1.29	1.06
AF700 w/ Metal Deck[1]	2.55	1.09	1.14	–	–	–	–	–	–
AF700 w/ Metal Deck[2]	2.75	1.11	1.14	–	–	–	–	–	–

1) Prying factors reflect the baseplate "B" dimension overhanging the edge of the metal deck. Used for DeWalt anchor loads.
2) Prying factors reflect the baseplate "A" or "B" dimension overhanging the edge of the metal deck. Used for NFPA & Hilti anchor loads.
3) Prying Factors calculated in accordance with NFPA 13-2019 Section A.18.5.12.2.

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Universal Swivel Attachment
Fig. AF700

Method 1 – Connection to Brace Member First

1. Slide the brace member over the lower jaw until it contacts the back wall.
2. Hand tighten the set screw until it contacts the brace member. Continue to torque the set screw until the head breaks off.
3. Rotate the brace assembly up to the fastener or the related seismic structural attachment and connect through the mounting hole.
4. Tighten per the fastener or structural attachment specifications.
5. Ensure the brace angle is within the range specified.

Notes: The cross bolt should be hand tight. For visual inspection, at least one thread should be exposed.

Method 2 – Connection to Structure First

1. Connect the AF700 to the fastener or the related seismic structural attachment.
2. Tighten per the fastener or structural attachment specifications.
3. Slide the brace member over the lower jaw until it contacts the back wall.
4. Hand tighten the set screw until it contacts the brace member. Continue to torque the set screw until the head breaks off.
5. Rotate the brace member until the brace angle is within the specified range.

Notes: The cross bolt should be hand tight. For visual inspection, at least one thread should be exposed..

Structural Attachments, Anchors, & Fasteners Listed, Approved, & Tested with the AF700

Structural Attachment	Structure
AF085	Steel Joist (Top Chord)
AF086	Horizontal Steel Flange (I-Beam Bottom Flange)
AF772	Horizontal Steel Flange (I-Beam Bottom Flange)
AF778	Horizontal Steel Flange (I-Beam Top or Bottom Flange) C-Channel (Top or Bottom Flange) Vertical Flange of a Joist (Top Chord)
AF779	All Structures with the Applicable Approved Anchor or Fastener
DeWalt Power-Stud®+ SD1	Cracked Concrete Cracked Concrete Filled Metal Deck
DeWalt Power-Stud®+ SD2	Cracked Concrete Cracked Concrete Filled Metal Deck
DeWalt Wood-Knocker®II+	Cracked Concrete
DeWalt Bang-It®+	Cracked Concrete Filled Metal Deck
DeWalt DDI+™	Cracked Concrete Filled Metal Deck
Anchors & Fasteners Per NFPA 13	Cracked Concrete Cracked Concrete Filled Metal Deck Steel Wood Saw Lumber or Glue-Laminated Timbers

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ASC Engineered Solutions

Model K Lateral Sway Brace
Fig. AF035

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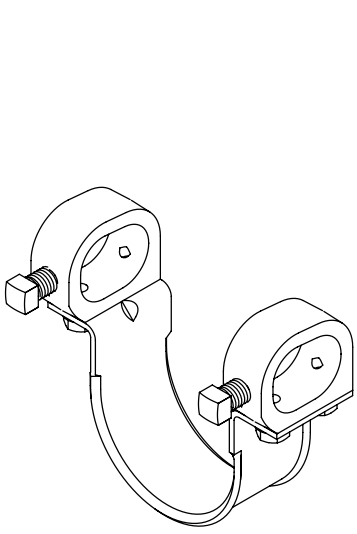
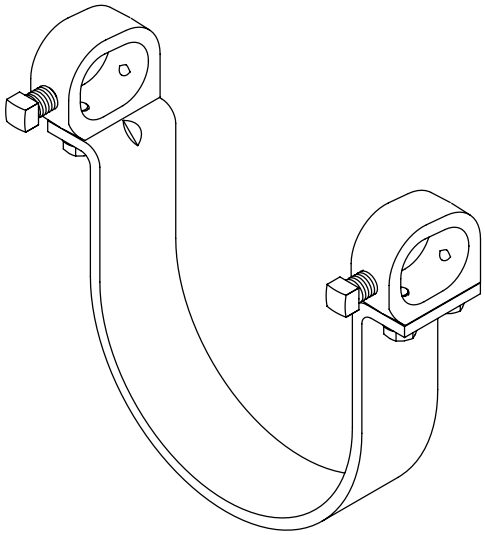


1" (DN25) to 3" (DN80) Service Pipe



4" (DN100) to 12" Service Pipe

Material Specifications

Size Range:
Service Pipe Size: 1" – 12"
Brace Member: 1" – 2"

Material
Ductile Iron Casting with Carbon Steel Strap and Hardware

Finish
☐ Plain
☐ Electro-Galvanized

Service
A seismic lateral brace designed to connect a brace member to the service pipe. The AF035 rigidly braces steel and CPVC piping systems subjected to horizontal and vertical seismic loads.

Approvals
cULus Listed (ANSI/UL 203a) and FM Approved (FM 1950-13). Complies with NFPA 13, ASCE 7, IBC, & MSS SP-127 bracing requirements.

Features
- The set screw provides a visual indication that proper installation has been achieved
- Rounded edge design eliminates potential for abrasion of CPVC pipe

Patents
No. 7,516,922, No. 7,523,895

Ordering
Specify figure number, service pipe size, brace size, finish, and description.

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PROJECT INFORMATION	APPROVAL STAMP
Project: PSE OTC	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	Remarks:
Submittal Date: May 23, 2024	
Notes 1:	
Notes 2:	

Model K Lateral Sway Brace
Fig. AF035

FIG. AF035: Weight Per Size

Service Pipe Size	Brace Member Size			
	1" (DN25)	1¼"(DN32)	1½" (DN40)	2" (DN50)
1 (DN25)	1.60 lbs	1.80 lbs	2.00 lbs	2.28 lbs
1¼" (DN32)	1.68 lbs	1.88 lbs	2.08 lbs	2.36 lbs
1½" (DN40)	1.64 lbs	1.84 lbs	2.04 lbs	2.32 lbs
2" (DN50)	1.88 lbs	2.08 lbs	2.28 lbs	2.56 lbs
2½"	1.90 lbs	2.10 lbs	2.30 lbs	2.58 lbs
DN65	2.00 lbs	2.20 lbs	2.40 lbs	2.68 lbs
3" (DN80)	2.10 lbs	2.30 lbs	2.50 lbs	2.78 lbs
4" (DN100)	2.18 lbs	3.38 lbs	3.58 lbs	3.76 lbs
5" (DN125)	3.40 lbs	3.60 lbs	3.80 lbs	4.08 lbs
DN150	3.80 lbs	4.00 lbs	4.20 lbs	4.48 lbs
6"	3.90 lbs	4.10 lbs	4.30 lbs	4.58 lbs
DN200	4.70 lbs	4.90 lbs	5.10 lbs	5.38 lbs
8"	4.80 lbs	5.00 lbs	5.20 lbs	5.48 lbs
10"	5.60 lbs	5.80 lbs	6.00 lbs	6.28 lbs
12"	6.16 lbs	6.36 lbs	6.56 lbs	6.84 lbs

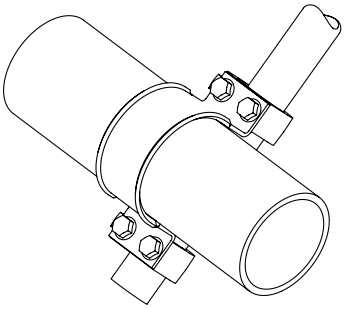
ASC Engineered Solutions

Model K Lateral Sway Brace
Fig. AF035

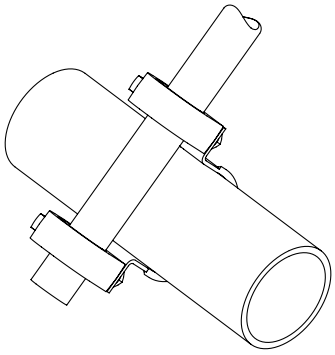
FIG. AF035 cULus Listing per ANSI/UL 203a (ASD)

Service Pipe Size	Standard Service Pipe	Speicalty Service Pipe	Horizontal Load Rating at Brace Angle			
			30°-44°	45°-59°	60°-90°	Listed
			lbf/kN	lbf/kN	lbf/kN	lbf/kN
1" (DN25)	Sch. 10 Sch. 40 CPVC Metric Pipe	Mega-Thread MLT / GL Eddy Thread EZ-Thread				
1¼" (DN32)	Sch. 10 Sch. 40 CPVC Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread EZ-Thread				
1½" (DN40)	Sch. 10 Sch. 40 CPVC Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread EZ-Thread Fire-Flo	625 2.78	884 3.93	1082 4.81	1250 5.56
2" (DN50)	Sch. 10 Sch. 40 CPVC Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread EZ-Thread Fire-Flo				
2½"	Sch. 10 Sch. 40 CPVC	Mega-Flow Eddy Flow Fire-Flo				
DN65	Metric Pipe	–				
3" (DN80)	Sch. 10 Sch. 40 CPVC Metric Pipe	Mega-Flow Eddy Flow Fire-Flo				
4" (DN100)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow Eddy Flow Fire-Flo				
5" (DN125)	Sch. 10 Sch. 40 Metric Pipe	–				
DN150	Metric Pipe	–	942 4.19	1333 5.93	1632 7.26	1885 8.38
6"	Sch. 10 Sch. 40	Mega-Flow				
DN200	Metric Pipe	–				
8"	0.188" wall Sch. 40	–				
10"	0.188" wall Sch. 40	–				
12"	0.188" wall Sch. 40	–	1125 5.00	1591 7.08	1948 8.67	2250 10.01

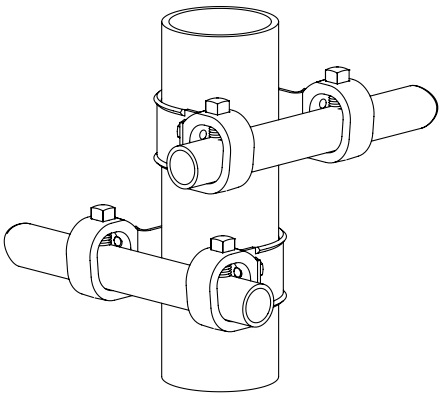
1) Brace Angles are determined from Vertical.
2) Sch. 10 & 0.188" Wall Load Ratings may be used for any thicker wall pipe of the same diameter.
3) Listed load ratings reduced for angle ranges in accordance with NFPA 13-2019 Table 18.5.2.3.
4) See table below for UL listed specialty pipes & UL Listed metric service pipes.
5) Load Ratings reflect 1" (DN25) – 2" (DN50) brace members. See table below for listed brace members.
6) Minimum safety factor of 2.2 in accordance with NFPA 13-2019 Section A.18.5.2.3.



Lateral Application



Lateral Application



Riser Application

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Building connections that last™

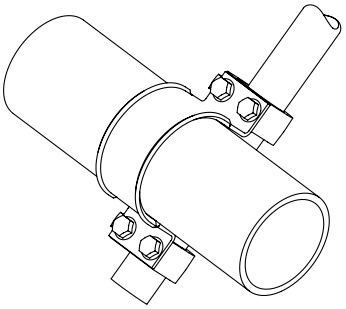
Model K Lateral Sway Brace
Fig. AF035

FIG. AF035 cULus Listing Per UL 203a (ASD) For NFPA 13-2016 Editions Or Earlier

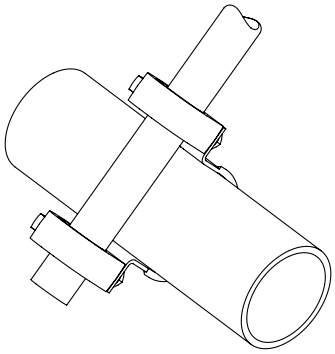
UL's current Listings are predicated on installation in accordance with the latest edition of NFPA 13. The 2016 and earlier editions of NFPA 13 referenced a minimum safety factor of 1.5 for the load rating as compared to 2.2 for the current edition. The load ratings noted in this table are consistent with the historical cULus Listings that were evaluated to the requirements of UL 203A, Outline of Investigation for Sway Brace Devices for Fire Sprinkler System Piping, based upon a minimum safety factor of 1.5 in accordance with the earlier editions of NFPA 13. The load ratings based upon the 2016 or earlier editions of NFPA 13 should only be used where approved by the Authority Having Jurisdiction (AHJ).

Service Pipe Size	Standard Service Pipe	Speicalty Service Pipe	Horizontal Load Rating at Brace Angle			
			30°-44°	45°-59°	60°-74°	75°-90°
			lbf/kN	lbf/kN	lbf/kN	lbf/kN
1" (DN25)	Sch. 10 Sch. 40 Metric Pipe	Mega-Thread MLT / GL Eddy Thread EZ-Thread				
1¼" (DN32)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread EZ-Thread				
1½" (DN40)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread EZ-Thread Fire-Flo				
2" (DN50)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread EZ-Thread Fire-Flo				
2½"	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow Eddy Flow Fire-Flo	1382 6.15	1955 8.70	2393 10.65	2765 15.52
DN65	Metric Pipe	–				
3" (DN80)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow Eddy Flow Fire-Flo				
4" (DN100)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow Eddy Flow Fire-Flo				
5" (DN125)	Sch. 10 Sch. 40 Metric Pipe	–				
DN150	Metric Pipe	–				
6"	Sch. 10 Sch. 40	Mega-Flow				
DN200	Metric Pipe	–				
8"	0.188" Wall Sch. 40	–				
10"	0.188" Wall Sch. 40	–				
12"	0.188" Wall Sch. 40	–	1870 8.32	2644 11.77	3238 14.40	3740 16.64

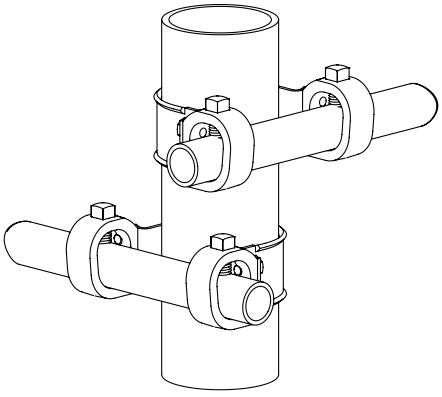
1) Brace Angles are determined from Vertical.
2) Sch. 10 & 0.188" Wall Load Ratings may be used for any thicker wall pipe of the same diameter.
3) Listed load ratings reduced for angle ranges in accordance with NFPA 13-2016 Section A.9.3.5.2.3.
4) See table below for UL listed specialty pipes & UL Listed metric service pipes.
5) Load Ratings reflect 1" (DN25) – 2" (DN50) brace members. See table below for listed brace members.
6) Minimum safety factor of 2.2 in accordance with NFPA 13-2016 Section A.9.3.5.2.3.



Lateral Application



Lateral Application



Riser Application

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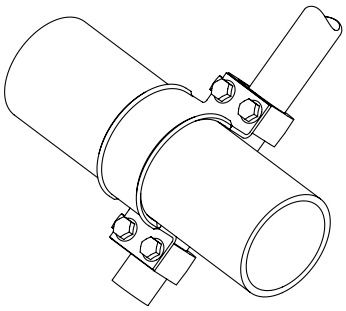
Model K Lateral Sway Brace
Fig. AF035

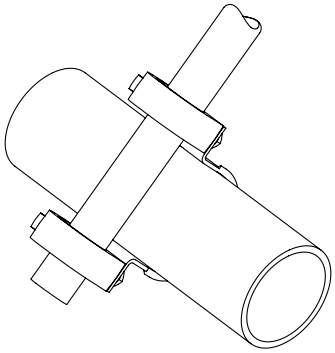
FIG. AF035 FM Approved (Listing) per FM 1950-13 (ASD)

Service Pipe Size	Standard Service Pipe	Speicalty Service Pipe	Horizontal Load Rating at Brace Angle			
			30°-44°	45°-59°	60°-74°	75°-90°
			lbf/kN	lbf/kN	lbf/kN	lbf/kN
1" (DN25)	Sch. 10 Sch. 40 Metric Pipe	Mega-Thread MLT / GL Eddy Thread EZ-Thread	1660 7.38	2350 10.45	2880 12.81	3210 14.28
1¼" (DN32)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread EZ-Thread				
1½" (DN40)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread EZ-Thread Fire-Flo	1540 6.85	2170 9.65	2660 11.83	2970 13.21
2" (DN50)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread EZ-Thread Fire-Flo				
2½"	Sch. 10 Sch. 40	Mega-Flow Eddy Flow Fire-Flo	1270 5.65	1790 7.96	2200 9.79	2450 10.90
DN65	Metric Pipe	–				
3" (DN80)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow Eddy Flow Fire-Flo				
4" (DN100)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow Eddy Flow Fire-Flo	1020 4.54	1450 6.45	1770 7.87	1980 8.81
5" (DN125)	Sch. 10 Sch. 40 Metric Pipe	–	860 3.83	1220 5.43	1490 6.63	1660 7.38
DN150	Metric Pipe	–				
6"	Sch. 10 Sch. 40	Mega-Flow				
DN200	Metric Pipe	–	540 2.40	770 3.43	950 4.23	1060 4.72
8"	0.188" Wall Sch. 40	–				

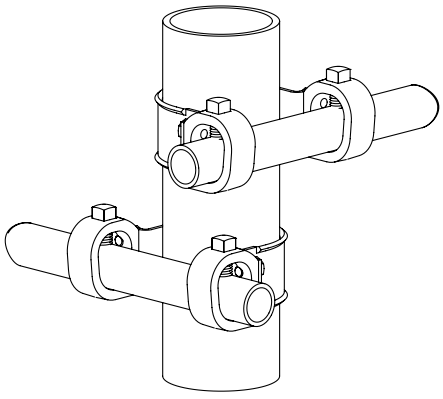
1) Brace Angles are determined from Vertical.
2) Sch. 10 & 0.188" Wall Load Ratings may be used for any thicker wall pipe of the same diameter.
3) See table below for FM listed specialty pipes & FM Listed metric service pipes.
4) Load Ratings reflect 1" (DN25) – 2" (DN50) brace members. See table below for listed brace members.
5) Minimum safety factor of 1.5 in accordance with NFPA 13-2016 Section A.9.3.5.2.3. To convert the load ratings above to a safety factor of 2.2 per NFPA 13-2019 Section A.18.5.2.3, multiply load ratings by a factor of 0.68.
5) To convert to LRFD Load Ratings, ASD Load Ratings may be multiplied by a factor of 1.5.



Lateral Application



Lateral Application



Riser Application

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Building connections that last™

Model K Lateral Sway Brace
Fig. AF035

1 Place the AF035 over the service pipe to be braced.

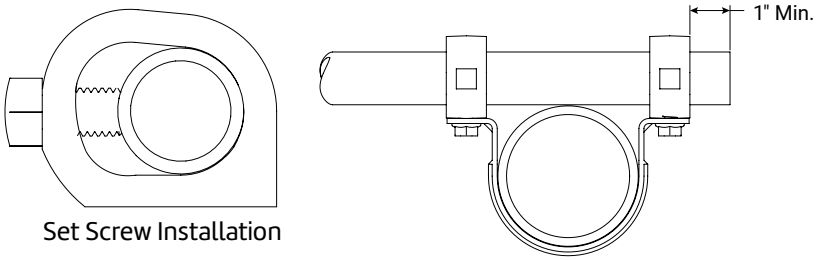
2 Insert the brace member through the cast hoop ends.
The end of the brace pipe shall extend at least 1" (25.4 mm) past the cast hoop ends.

3 Hand tighten the set screws until they contact the brace member.
Continue to torque the set screws until the heads bottom out on the cast hoop ends.

4 Tighten per the fastener or structural attachment specifications.

5 Ensure the brace angle is within the specified range.

Notes: The brace member may be installed above or below the service pipe.



Set Screw Installation

FIG. AF035 cULus Listed & FM Approved Brace Members

Brace Member	Brace Size	Standard (or Equivalent)	UL	FM
Sch. 40 NPS Pipe	1", 1¼", 1½", 2"	ASTM A53, A106, A135, or A795	✓	✓
Sch. 40 Metric Pipe	DN25 DN32 DN40 DN50	KS S 3562	✓	✓
		EN10255H		✓
Metric Pipe		GB/T 3091		✓
		JIS G3454		✓

FIG. AF035 cULus Listed & FM Approved Metric Service Pipes

Service Pipe Standard (or Equivalent)	Service Pipe Size	UL	FM
KS D 3507 KS D 3537	DN25 DN32 DN40 DN50 DN65 DN80 DN100 DN125 DN150 DN200	✓	✓
KS D 3562 Sch. 40		✓	✓
GB/T 3091 GB/T 3092			✓
JIS G3452			✓
EN 10255M			✓
EN 10255H			✓

Notes:
ASC Engineered Solutions™ brand bracing components are designed to be compatible ONLY with other ASC Engineered Solutions brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

Disclaimer:
ASC Engineered Solutions does not provide any warranties and specifically disclaims any liability whatsoever with respect to ASC bracing products and components that are used in combination with products, parts or systems not manufactured or sold by ASC. In no event shall ASC be liable for any incidental, direct, consequential, special or indirect damages or lost profits where non-ASC bracing components have been, or are used.

Seis Brace® Seismic Fire Protection Design Tool may be accessed at www.seisbrace.com

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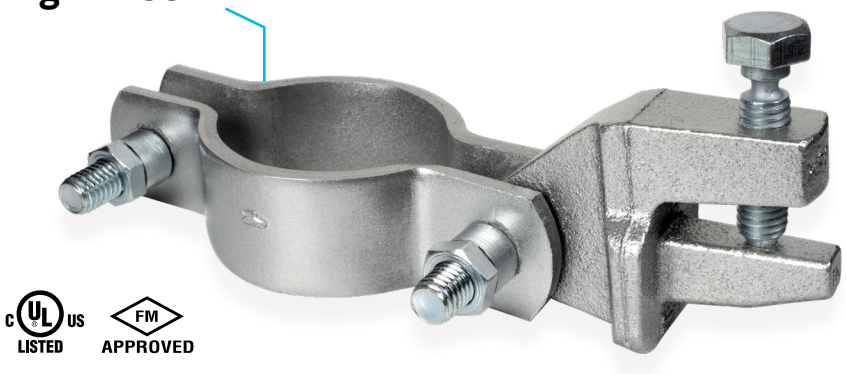
Building connections that last™

ASC Engineered Solutions

Longitudinal & Lateral Seismic Clamp
Fig. AF730



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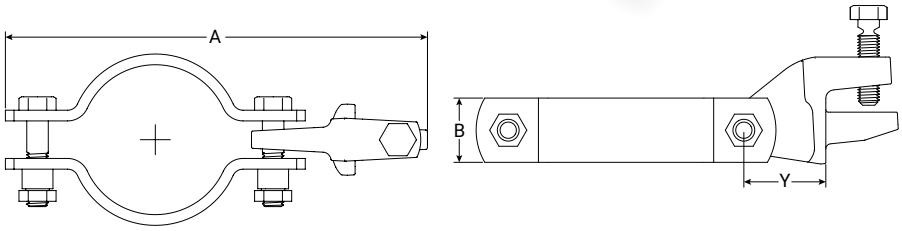


FIG. AF730 Dimensions and Weight

Size	A In./mm	B In./mm	Y In./mm	Weight lbs/kgs
1" (DN25)	7.6 193	1.50 38.1	1.91 48.5	2.49 1.13
1½" (DN32)	8.0 203			2.55 1.13
1½" (DN40)	8.2 208			2.64 1.20
2" (DN50)	8.7 221			2.78 1.26
2½"	9.2 234			2.92 1.32
3" (DN80)	9.8 249			3.13 1.42
4" (DN100)	10.8 274			3.38 1.53
5"	12.1 307			3.81 1.73
6"	13.2 335			4.12 1.87
8"	15.2 386			6.40 2.90
10"	18.1 460			7.60 3.45
12"	20.1 511			8.60 3.90

Notes:
ASC Engineered Solutions™ brand bracing components are designed to be compatible ONLY with other ASC Engineered Solutions brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

Material Specifications

Size Range
Service Pipe Size: 1" – 12", DN25–DN100

Material
Carbon Steel Clamp and Hardware. Ductile Iron Brace Member Attachment Fitting.

Finish
- ☐ Plain
- ☐ Clamp: Hot Dipped Galvanized per ASTM A153
- ☐ Brace Member Attachment Fitting: Electro-Galvanized per ASTM B633

Service
A seismic longitudinal and lateral brace clamp designed to connect a piping system to a brace member. The AF730 rigidly braces piping systems subjected to horizontal and vertical seismic loads.

Approvals
cULus Listed (ANSI/UL 203a) and FM Approved (FM 1950–13). FM Tested (ANSI/FM 1950–16). Complies with NFPA 13, ASCE 7, IBC, & MSS SP–127 bracing requirements.

Features
- Torque off set screw and nuts provide a visual indication that the desired installation torque values have been achieved.

Ordering
Specify figure number, service pipe size, finish, and description.

Disclaimer:
ASC Engineered Solutions does not provide any warranties and specifically disclaims any liability whatsoever with respect to ASC bracing products and components that are used in combination with products, parts or systems not manufactured or sold by ASC. In no event shall ASC be liable for any incidental, direct, consequential, special or indirect damages or lost profits where non-ASC bracing components have been, or are used.

Seis Brace® Seismic Fire Protection Design Tool may be accessed at www.seisbrace.com

AFCON
An ASC Engineered Solution

PROJECT INFORMATION	APPROVAL STAMP
Project: PSE OTC	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	Remarks:
Submittal Date: May 23, 2024	
Notes 1:	
Notes 2:	

ASC Engineered Solutions

Longitudinal & Lateral Seismic Clamp
Fig. AF730

FIG. AF730 cULus Listing per ANSI/UL 203a (ASD)

Service Pipe Size	Standard Service Pipe	Specialty Service Pipe	Horizontal Load Rating at Brace Angle							
			Longitudinal Load Rating				Lateral Load Rating			
			30°-44°	45°-59°	60°-90°	Listed	30°-44°	45°-59°	60°-90°	Listed
			lbf/kN	lbf/kN	lbf/kN	lbf/kN	lbf/kN	lbf/kN	lbf/kN	lbf/kN
1" (DN25)	Sch. 10 Sch. 40 Metric Pipe	Mega-Thread MLT / GL Eddy Thread EZ-Thread	340 1.51	480 2.14	588 2.62	680 3.02	340 1.51	480 2.14	588 2.62	680 3.02
1¼" (DN32)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread EZ-Thread								
1½" (DN40)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread Fire-Flo EZ-Thread	375 1.67	530 2.36	649 2.89	750 3.34	375 1.67	530 2.36	649 2.89	750 3.34
2" (DN50)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread Fire-Flo EZ-Thread								
2½"	Sch. 10 Sch. 40	Mega-Flow Eddy Flow Fire-Flo	545 2.42	770 3.43	943 4.19	1090 4.85	545 2.42	770 3.43	943 4.19	1090 4.85
3" (DN80)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow Eddy Flow Fire-Flo								
4" (DN100)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow Eddy Flow Fire-Flo								
5"	Sch. 10 Sch. 40	–								
6"	Sch. 10 Sch. 40	Mega-Flow	942 4.19	1333 5.93	1632 7.26	1885 8.38	942 4.19	1333 5.93	1632 7.26	1885 8.38
8"	Sch. 10 0.188" Wall Sch. 40	–								
10"	0.188" Wall Sch. 40	–								

Brace Angles are determined from Vertical.

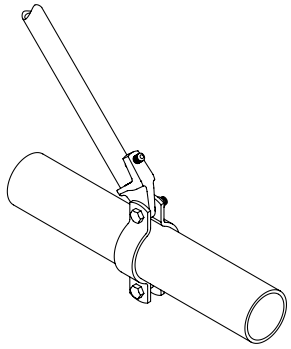
Sch. 10 & 0.188" Wall Load Ratings may be used for any thicker wall pipe of the same diameter.

Listed load ratings reduced for angle ranges in accordance with NFPA 13-2019 Table 18.5.2.3.

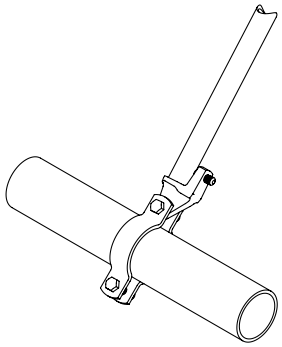
See table on page 4 for UL listed specialty pipes & UL Listed metric service pipes.

See table on page 4 for UL listed brace members.

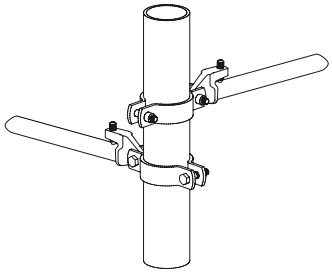
Load ratings include a minimum safety factor of 2.2 in accordance with NFPA 13-2019 Section A.18.5.2.3.
All load ratings may be used for NFPA 13-2016 designs.



Longitudinal Application



Lateral Application



Riser Application

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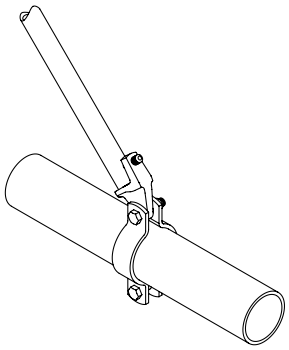
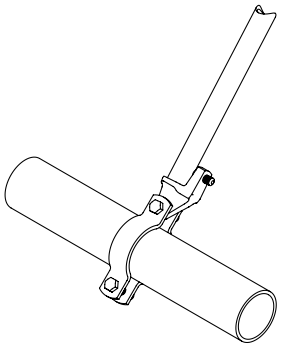
Longitudinal & Lateral Seismic Clamp
Fig. AF730

FIG. AF730 FM Approved (Listing) per FM 1950-13 (ASD)

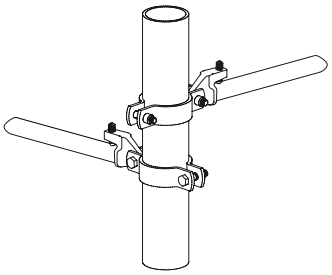
Service Pipe Size	Standard Service Pipe	Specialty Service Pipe	Horizontal Load Rating at Brace Angle							
			Longitudinal Load Rating				Lateral Load Rating			
			30˚-44˚	45˚-59˚	60˚-74˚	75˚-90˚	30˚-44˚	45˚-59˚	60˚-74˚	75˚-90˚
			lbf/kN	lbf/kN	lbf/kN	lbf/kN	lbf/kN	lbf/kN	lbf/kN	lbf/kN
1" (DN25)	Sch. 10 Sch. 40 Metric Pipe	Mega-Thread MLT / GL Eddy Thread EZ-Thread	550 2.24	640 2.84	670 2.98	740 3.29	1740 7.74	2460 10.94	3010 13.39	3360 14.95
1¼" (DN32)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread EZ-Thread	740 3.29	680 3.02	820 3.65	1620 7.21	1430 6.36	2020 8.99	2480 11.03	2770 12.32
1½" (DN40)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread Fire-Flo EZ-Thread	800 3.56	650 2.89	790 3.51	1800 8.01	1790 7.96	2530 11.25	3100 13.79	3460 15.39
2" (DN50)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow MLT / GL Mega-Thread Eddy Flow Eddy Thread Fire-Flo EZ-Thread	830 3.69	990 4.4	1190 5.29	1620 7.21	1820 8.1	2580 11.48	3160 14.06	3530 15.7
2½"	Sch. 10 Sch. 40	Mega-Flow Eddy Flow Fire-Flo	800 3.65	700 3.11	850 3.78	1930 8.59	1610 7.16	2280 10.14	2790 12.41	3120 13.88
3" (DN80)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow Eddy Flow Fire-Flo	960 4.27	1330 5.92	1540 6.85	1700 7.56	1550 6.89	2200 9.79	2690 11.97	3010 13.39
4" (DN100)	Sch. 10 Sch. 40 Metric Pipe	Mega-Flow Eddy Flow Fire-Flo	760 3.38	1040 4.63	1270 5.65	1400 6.23	1260 5.6	1790 7.96	2190 9.74	2440 10.85
5"	Sch. 10 Sch. 40	–	890 3.96	1230 5.47	1410 6.27	1550 6.89	1260 5.6	1790 7.96	2190 9.74	2440 10.85
6"	Sch. 10 Sch. 40	Mega-Flow	700 3.11	940 4.18	1140 5.07	1310 5.83	950 4.23	1340 5.96	1640 7.3	1830 8.14
8"	0.188" Wall Sch. 40	–	990 4.4	1130 5.03	1360 6.05	1520 6.76	1540 6.85	2170 9.65	2660 11.82	2970 13.21
10"	0.188" Wall Sch. 40	–	1020 4.54	850 3.78	1000 4.45	1100 4.89	1700 7.56	2410 10.72	2950 13.12	3290 14.63
12"	0.188" Wall Sch. 40	–	970 4.31	1010 4.49	1220 5.43	1430 6.36	1690 7.52	2390 10.63	2930 13.03	3270 14.55



Longitudinal Application



Lateral Application



Riser Application

Brace Angles are determined from Vertical.

Sch. 10 & 0.188" Wall Load Ratings may be used for any thicker wall pipe of the same diameter.

Load ratings include a minimum safety factor of 1.5 in accordance with NFPA 13-2016 Section A.9.3.5.2.3. To convert the load ratings above to a safety factor of 2.2 per NFPA 13-2019 Section A.18.5.2.3, multiply load ratings by a factor of 0.68.

To convert to LRFD Load Ratings, ASD Load Ratings may be multiplied by a factor of 1.5.

See table on page 4 for FM approved metric service pipes.

See table on page 4 for FM approved brace members.

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Longitudinal & Lateral Seismic Clamp
Fig. AF730

Method 1 – Connection to Brace Member First

1. Slide the brace member over the lower jaw until it contacts the back wall of the brace member attachment fitting.
2. Hand tighten the set screw until it contacts the brace member. Continue to torque the set screw until the head breaks off.
3. Rotate the brace assembly to the service pipe. Unbolt the back nut & bolt and rotate the clamp halves over the service pipe. Re-assemble the nut and bolt.
4. Hand tighten the nuts on both sides of the clamp. Evenly and alternately torque the nut until the head breaks off. It is best practice to tighten the nut at the jaw side first.
5. Ensure the brace angle is within the range specified.

Method 2 – Connection to Service Pipe First

1. Unbolt the back nut & bolt and rotate the clamp halves over the service pipe. Re-assemble the nut and bolt.
2. Hand tighten the nuts on both sides of the clamp. Evenly and alternately torque the nut until the head breaks off. It is best practice to tighten the nut at the jaw side first.
3. Slide the brace member over the lower jaw until it contacts the back wall of the brace member attachment fitting.
4. Hand tighten the set screw until it contacts the brace member. Continue to torque the set screw until the head breaks off.

FIG. AF730 cULus Listed & FM Approved Brace Members

Brace Member	Sizes	Standards (or Equivalent)	UL Listed	FM Approved
Sch. 40 NPS Pipe	1", 1¼", 1½", 2"	ASTM A53, A106, A135, or A795	✓	✓
Sch. 40 Metric Pipe	DN25, DN32, DN40, DN50	KS D 3562	✓	✓
Metric Pipe		EN10255H		✓
		GB/T 3091		✓
		JIS G3454		✓

FIG. AF730 cULus Listed & FM Approved Metric Service Pipes

Brace Member	Service Pipe Sizes	UL Listed	FM Approved
KS D 3507 KS D 3537	DN25, DN32, DN40, DN50, DN 80, DN100	✓	✓
KS D 3562 Sch. 40		✓	✓
GB/T 3091 GB/T 3092			✓
JIS G3452			✓
EN 10255M			
EN 10255H			

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