Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
Little Rock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 10/10/2023
Return Request: 10/16/2023
Project: ASU Mid-South RC & UC Chiller Replacement
Supplier: Fluid Solutions
Manufacturer: Mason Industries
Submittal: Vibration & Seismic For HVAC Piping
Submittal Number: 23 05 48-01
Drawing # and Installation: Mechanical Drawings

ARCHITECT
Witsell Evans Rasco
901 W. Third Street
Little Rock, AR 72201
501-374-5300

ENGINEER
Pettit & Pettit
201 E. Markham St. #400
Little Rock, AR 72201
501-374-3731

GENERAL CONTRACTOR
Baldwin & Shell
3725 Champion Hills Driver, Suite 1300
Memphis, TN 38125
901-755-2952

MECHANICAL SUBCONTRACTOR
Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

CSUSA PROJECT NO.
23-1024
jon@comfortar.com

PRELIMINARY SUBMITTAL DATA

DATE: August 31, 2023
PROJECT: ASU Midsouth
CONTRACTOR: Comfort Systems USA
ENGINEER: Pettit & Pettit Engineers

MASON INDUSTRIES SEISMIC HVAC RESTRAINTS

Fluid Solutions will provide detailed shop drawings and calculations for the equipment as listed below. The shop drawings will be prepared in detail and along with calculations after approval of the equipment submittals.

1	Set	Seismic Cable Bracing w/ Engineered Calcs	KH-1
1	Set	Seismic Cable Bracing w/ Engineered Calcs	AS
1	Lot	Seismic Cable Bracing w/ Engineered Calcs	Piping 3-1/2" & Lrgr, Dwg. M1.01 (Approx 20 Sets)

115 S. Victory · P.O. Box 3652 · Little Rock, AR 72201
Phone (501) 663-8886 · Fax (501) 663-8738
www.fluidsolutionsinc.com

EQUIPMENT RESTRAINTS

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Chapter 10

SUSPENDED EQUIPMENT

The basic design requirements for bracing of suspended equipment are as follows:

1. Sway braces should be arranged so that they limit motion of the equipment in all directions.
2. Threaded rods should be designed to resist vertical seismic loads and support equipment.
3. Equipment supported by vibration-isolation hangers should be detailed and installed with isolation hangers close to the structure and upward limit stops located directly below the hangers.
4. Avoid bracing equipment to separate portions of the structure that may act differently in response to an earthquake. For example, do not connect a transverse brace to a wall and a longitudinal brace to a floor or roof at the same brace location.

SWAY BRACING

Sway bracing of suspended equipment differs from piping, ductwork, or other suspended systems. Equipment is braced independently of surrounding systems, such as ductwork and piping, and requires restraint in all horizontal and vertical directions.

There are two types of sway braces, solid and cable, each with advantages and disadvantages as discussed in Chapter 7.

Figures 10-1 and 10-2 show typical solid and cable brace arrangements for suspended equipment. In the extreme case the unit is square in plan, it is possible the unit may rotate and therefore an eight-cable arrangement is recommended, as shown in Figure 10-3.

HANGER ROD REQUIREMENTS

The effects of sway bracing on the hanger rod are discussed in more detail in Chapter 7. Following is a discussion of how loads are applied to hanger rods for suspended equipment.

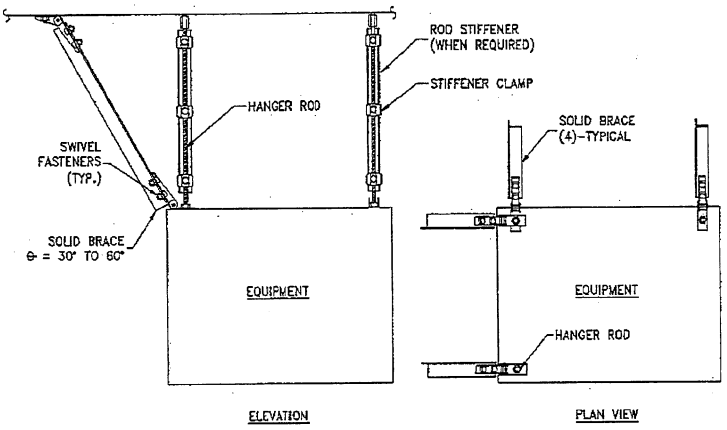

Figure 10-1 Typical solid brace arrangement.

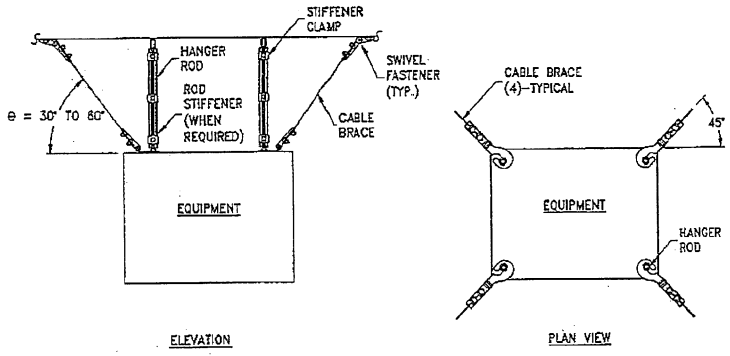

Figure 10-2 Typical cable brace arrangement.

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Manufacturers of Vibration Control Products
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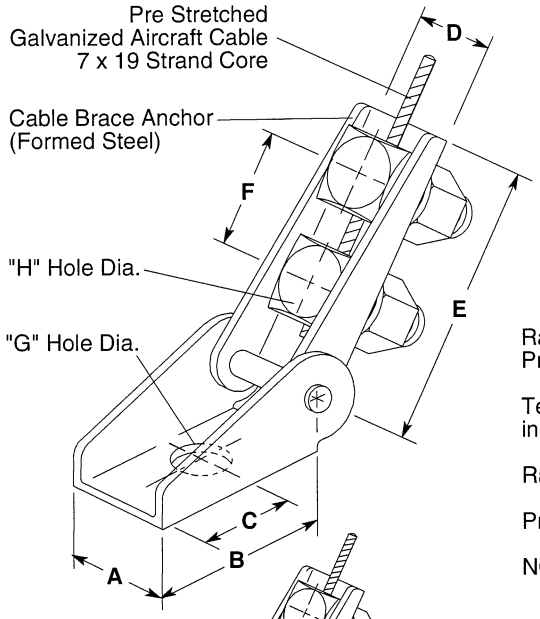
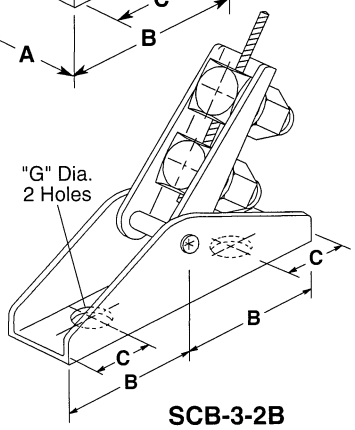
2101 W. Crescent Ave., Suite D, Anaheim, CA 92801, 714/535-2727, FAX 714/535-5738, Info@MasonAnaheim.com

CERTIFIED FOR :
JOB NAME :
CUSTOMER :
CUSTOMER P.O. :
MASON M.I. :
DWG NO. :

TYPE
SCB
Seismic Cable Brace Anchor & Assembly

SCB-1,2,3 & 4





SCB-3-2B

APPROVED
California Office of Statewide Health Planning and Development
FIXED EQUIPMENT ANCHORAGE
OPA-0349 August 5, 2002
*Valid for 3 Years Maximum
Bill Staehlln (916) 654-3362

TYPE SCB ASSEMBLY RATING AS CONTROLLED BY CABLE BREAK STRENGTH

Size	Cable Diameter (in)	Cable Diameter (mm)	OSHPD Max Ratings (lbs)	OSHPD Max Ratings (kg)
SCB-1	1/8	3	975	442
SCB-2	3/16	5	2050	930
SCB-3 & -3-2B	1/4	6	3150	1429
SCB-4	3/8	10	6875	3119

Ratings are from test data and calculations used to obtain California OSHPD Preapproval Number R-0349.

Testing was supervised and certified by an independant engineer registered in the state of california.

Ratings are based on attachment to steel.

Preferred installation ange is 45° Maximum variation ±15°.

NOTE: Not to be used as a vertical hanger for equipment, duck work or piping. To be used as a seismic restraint only.

TYPE SCB ANCHOR DIMENSIONS (inches)

Size	A	B	C	D	E	F	G	H
SCB-1	1 3/8	2	1	15/16	3 3/8	1 1/2	9/16	1/2
SCB-2	1 5/8	2 3/4	1 3/8	1 3/16	4 3/8	1 3/4	11/16	5/8
SCB-3	2	3 1/2	1 3/4	1 7/16	4 3/4	2	13/16	3/4
SCB-3-2B	2	4 3/4	1	1 7/16	4 3/4	2	13/16	3/4
SCB-4	3 1/8	5	2 1/2	1 15/16	5 3/4	2 1/4	1 5/16	1

TYPE SCB ANCHOR DIMENSIONS (mm)

Size	A	B	C	D	E	F	G	H
SCB-1	35	51	25	24	86	38	14	13
SCB-2	41	70	35	30	111	44	17	16
SCB-3	51	89	44	37	121	51	21	19
SCB-3-2B	51	121	25	37	121	51	21	19
SCB-4	79	127	64	49	146	57	33	25

TORQUE VALUES

Diameter	Torque Foot Pounds		Torque Kilogram-Meters	
	Minumum	Maximum	Minimum	Maximum
1/2"	25	29	3.5	4.1
5/8"	45	52	6.3	7.3
3/4"	55	64	7.7	9.0

CERTIFICATION DATA

TAG: _____

UNIT: _____

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FORM S-102-2a

MASON INDUSTRIES, Inc.

Manufacturers of Vibration Control Products

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Info@MasonAnaheim.com

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CUSTOMER: _____

CUSTOMER P.O.: _____

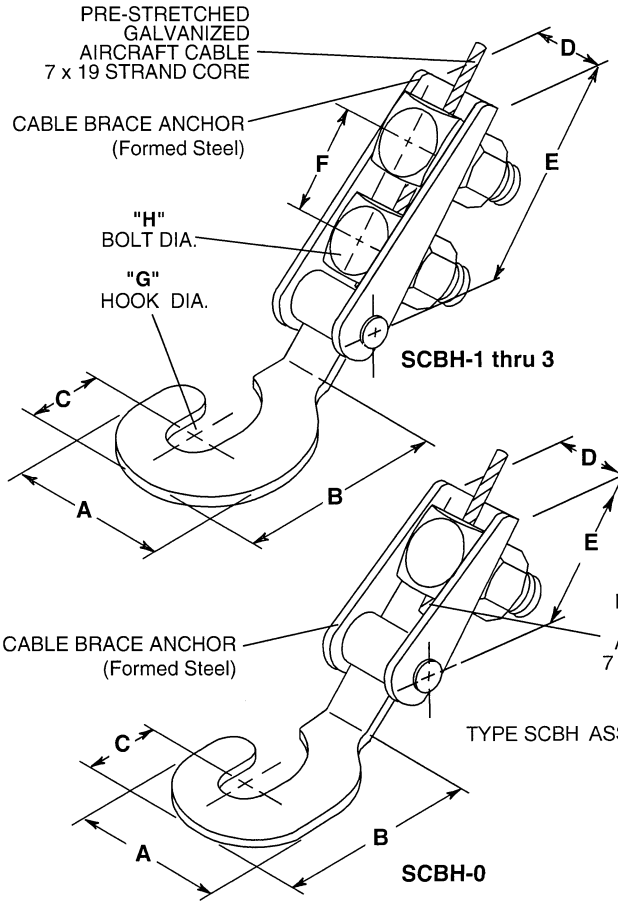
MASON M.I.: _____

DWG. NO. : _____

TYPE

SCBH

SEISMIC CABLE BRACE HOOK ANCHOR & ASSEMBLY



TYPE SCBH ASSEMBLY

TYPE SCBH ANCHOR DIMENSIONS (inches mm)

Size	For use with Rod Sizes	A	B	C	D	E	F	G	H
SCBH-0	3/8	1 3/8	2 1/16	1 1/16	15/16	1 3/4	--	3/8	1/2
SCBH-1	1/2, 5/8	1 7/8	2 3/8	1	1	3 3/8	1 1/2	5/8	1/2
SCBH-2	3/4,7/8	2 7/8	3 3/4	1 3/8	1 3/8	4 3/8	1 3/4	7/8	5/8
SCBH-3	1, 1 1/8	3 1/2	4 3/4	1 3/4	1 3/4	4 3/4	2	1 1/8	3/4
SCBH-0	10	35	50	17	24	44		10	13
SCBH-1	13, 16	48	60	25	25	86	38	16	13
SCBH-2	19, 22	73	95	35	30	111	44	22	16
SCBH-3	25, 28	89	121	44	37	121	51	29	19

TORQUE VALUES

Diameter	Torque Foot Pounds		Torque Kilogram-Meters	
	Minumum	Maximum	Minimum	Maximum
1/2"	25	29	3.5	4.1
5/8"	45	52	6.3	7.3
3/4"	55	64	7.7	9.0

RATINGS AS CONTROLLED BY CABLE BREAK STRENGTH

Size	Cable Dia. (in)	(mm)	OSHPD Max. Ratings (lbs)	(kgs)
SCBH-0	1/16	(1.5)	240	(110)
SCBH-1	1/8	(3.0)	975	(442)
SCBH-2	3/16	(5.0)	2050	(930)
SCBH-3	1/4	(6.0)	3150	(1429)

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California Office of Statewide Health Planning and Development

FIXED EQUIPMENT ANCHORAGE

OPA-0349 AUGUST 5, 2002

*Valid for 3 Years Maximum

Bill Staehlin (916) 654-3362

Ratings for SCBH-1 thru -3 are from test data and calculations used to obtain California OSHPD Preapproval Number OPA-0349. Testing was supervised and certified by an independent engineer regestered in the state of California. Ratings are based on attachment to steel. SCBH assemblies will fit rod sizes as tabulated. Prefered installation angle is 45 degrees. Maximum variation is ± 15 degrees

CERTIFICATION DATA

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PIPING RESTRAINTS

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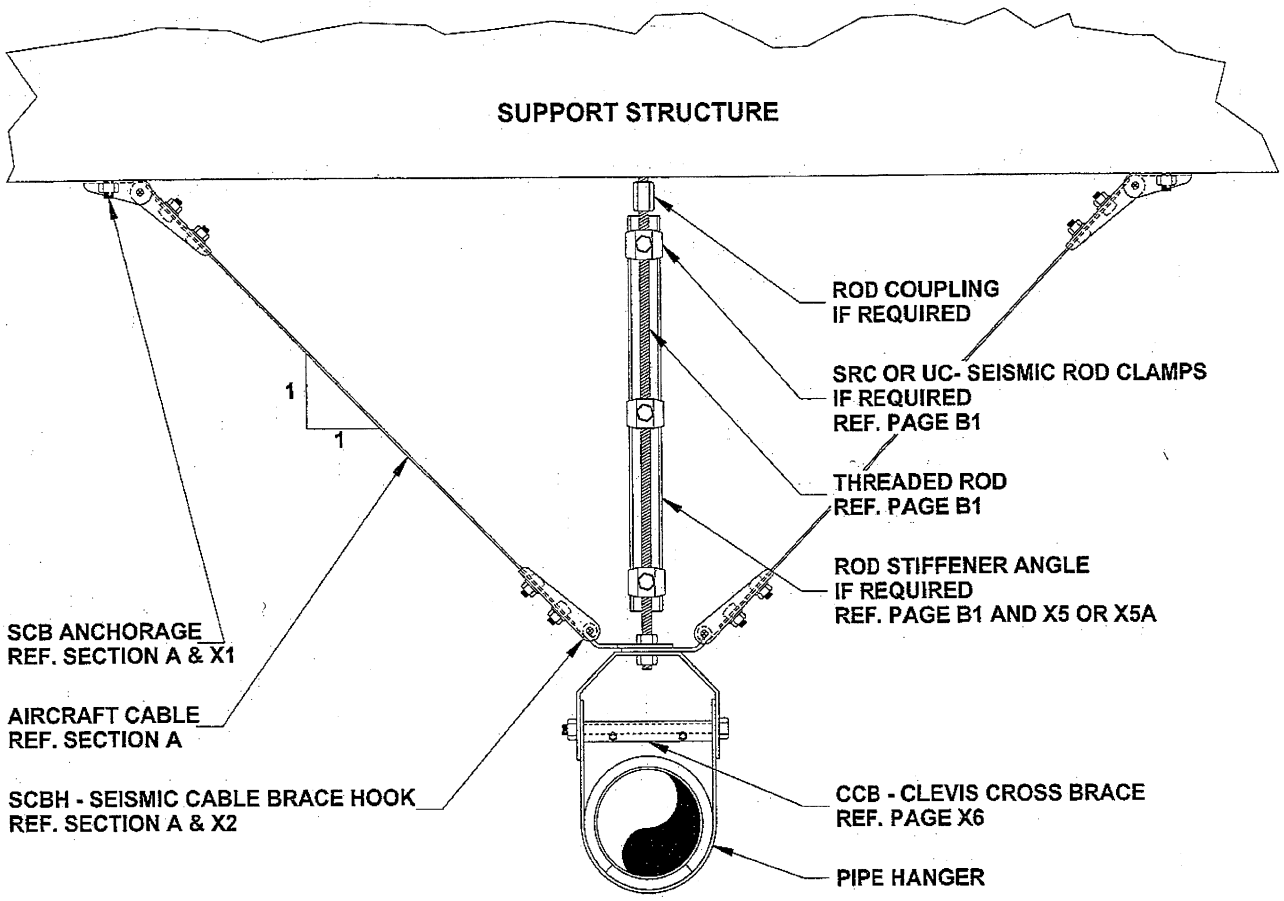
TRANSVERSE SEISMIC CABLE BRACE HOOK GUIDELINES FOR CLEVIS SUPPORTED SYSTEMS



NOTE 1: A ROD STIFFENER ANGLE MAY BE REQUIRED AS SHOWN. FOR ADDITIONAL INFORMATION, REF. PAGE B1. BRACE ANGLE RATIO MAY BE INCREASED TO 2(VERT) : 1(HORIZ.). REFER TO SECTION A FOR LIMITATIONS. REFER TO PAGE X2 FOR PROPER INSTALLATION OF THE SCBHS.

Note 2: For tightening requirements of bolts, nuts and strut nuts reference H15.

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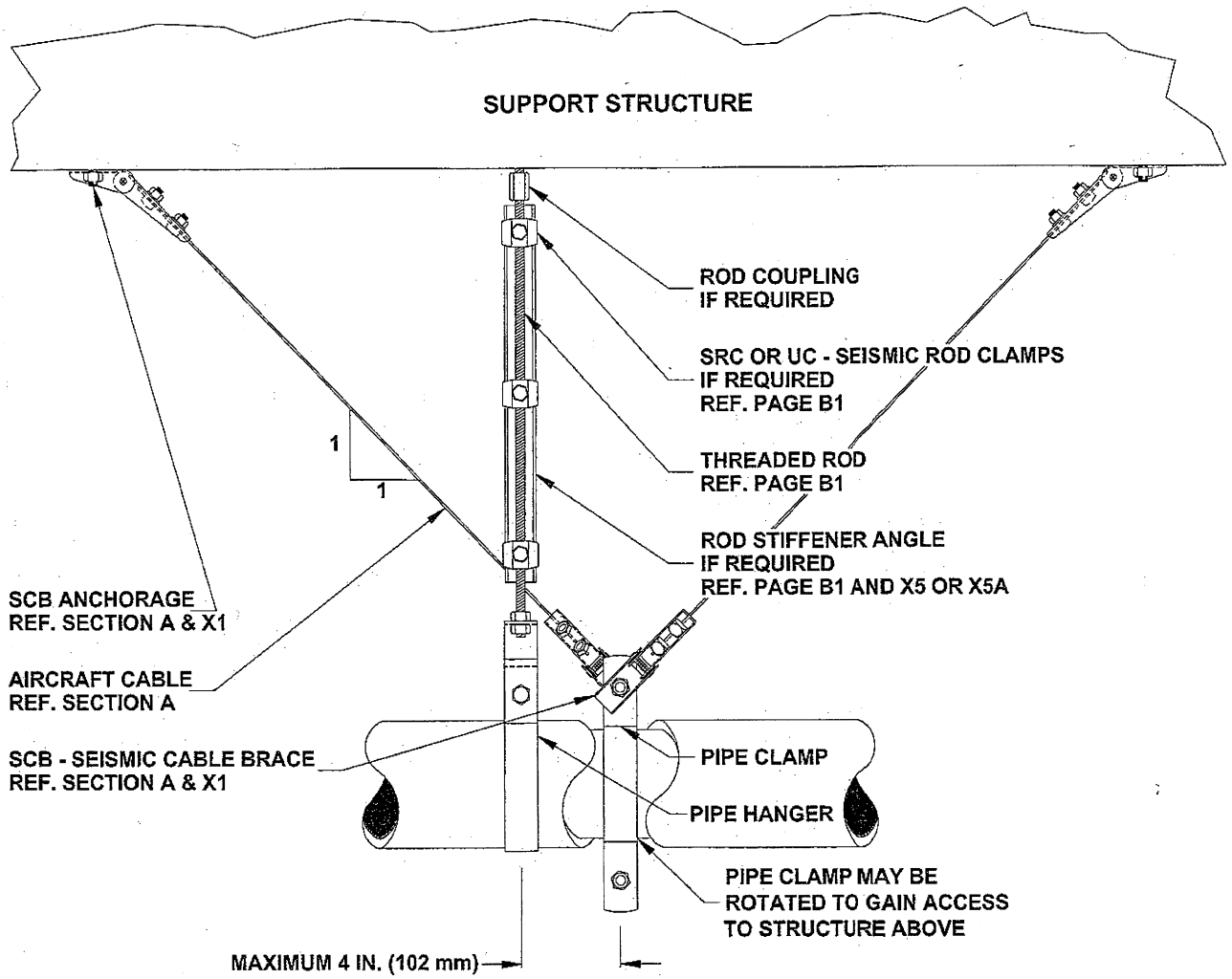
OPA-0349 August 5, 2002
Bill Staehlin (916) 654-3362

Dhiru Mali
Structural Engineer
California SE No. 2811

LONGITUDINAL SEISMIC CABLE BRACE GUIDELINES FOR CLEVIS SUPPORTED SYSTEMS



NOTE 1: A ROD STIFFENER ANGLE MAY BE REQUIRED AS SHOWN. FOR ADDITIONAL INFORMATION, REF. PAGE B1. BRACE ANGLE RATIO MAY BE INCREASED TO 2(VERT.) : 1(HORIZ.). REFER TO SECTION A FOR LIMITATIONS.

NOTE 2: FOR TIGHTENING REQUIREMENTS OF BOLTS, NUTS AND STRUT NUTS REFERENCE H15.

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OPA-0349 August 5, 2002

Bill Staehlin (916) 654-3362

Dhiru Mali
Structural Engineer
California SE No. 2811

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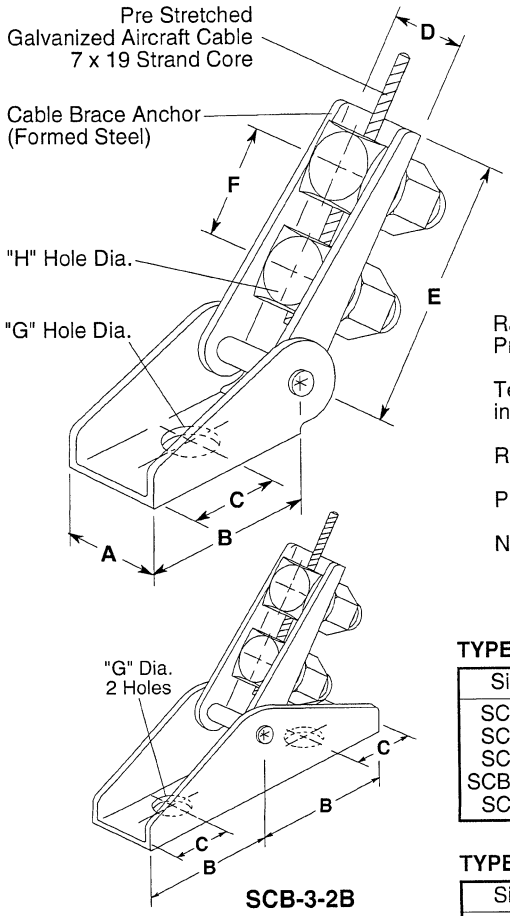
CUSTOMER :
CUSTOMER P.O. :
MASON M.I. :
DWG NO. :

TYPE
SCB
Seismic Cable Brace Anchor & Assembly

SCB-1,2,3 & 4



SCB-3-2B

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Size	Cable Diameter (in)	(mm)	OSHPD Max Ratings (lbs)	(kg)
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Ratings are from test data and calculations used to obtain California OSHPD Preapproval Number R-0349.

Testing was supervised and certified by an independant engineer registered in the state of california.

Ratings are based on attachment to steel.

Preferred installation ange is 45° Maximum variation ±15°.

NOTE: Not to be used as a vertical hanger for equipment, duck work or piping. To be used as a seismic restraint only.

TYPE SCB ANCHOR DIMENSIONS (inches)

Size	A	B	C	D	E	F	G	H
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SCB-3	2	3 1/2	1 3/4	1 7/16	4 3/4	2	13/16	3/4
SCB-3-2B	2	4 3/4	1	1 7/16	4 3/4	2	13/16	3/4
SCB-4	3 1/8	5	2 1/2	1 15/16	5 3/4	2 1/4	1 5/16	1

TYPE SCB ANCHOR DIMENSIONS (mm)

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TORQUE VALUES

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FIXED EQUIPMENT ANCHORAGE
OPA-0349 August 5, 2002
*Valid for 3 Years Maximum
Bill Staehlin (916) 654-3362

CERTIFICATION DATA

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DWN :	CHKD:	DATE :

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FORM S-102-2a

MASON INDUSTRIES, Inc.

Manufacturers of Vibration Control Products

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CUSTOMER : _____
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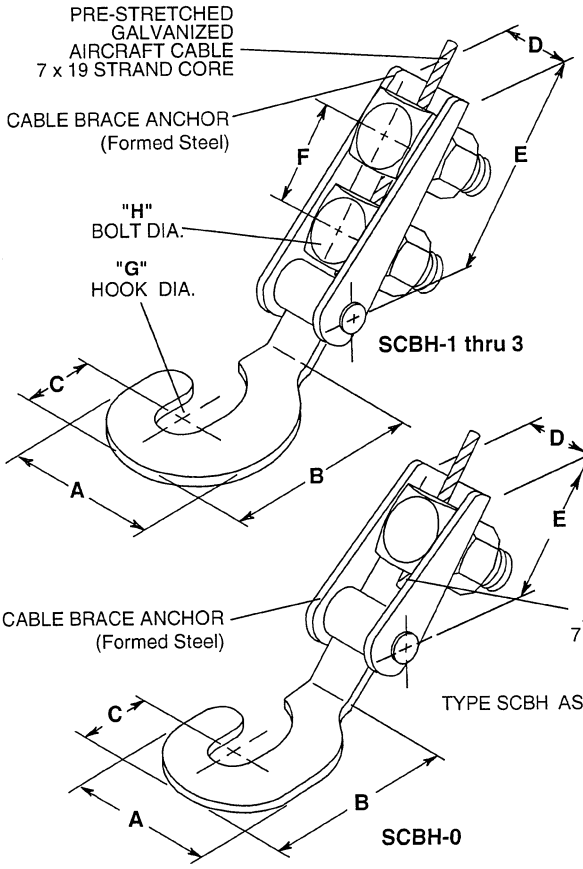
MASON M.I. : _____
DWG. NO. : _____

TYPE
SCBH
SEISMIC CABLE BRACE HOOK ANCHOR & ASSEMBLY



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SCBH-2	3/4,7/8	2 7/8	3 3/4	1 3/8	1 3/8	4 3/8	1 3/4	7/8	5/8
SCBH-3	1, 1 1/8	3 1/2	4 3/4	1 3/4	1 3/4	4 3/4	2	1 1/8	3/4
SCBH-0	10	35	50	17	24	44		10	13
SCBH-1	13, 16	48	60	25	25	86	38	16	13
SCBH-2	19, 22	73	95	35	30	111	44	22	16
SCBH-3	25, 28	89	121	44	37	121	51	29	19

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APPROVED

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FIXED EQUIPMENT ANCHORAGE

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