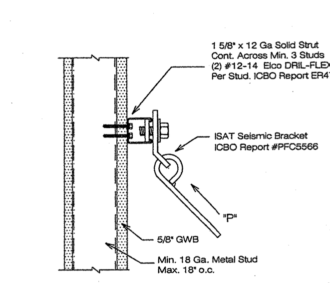

SEISMIC RESTRAINT CONNECTION
TO METAL STUD GWB ASSEMBLY
"P"MAX = 600 LBS.

Prior Approval From Engineer of Record Required
Prior To Installing Seismic Restraint Wall Anchorage

A P P R O V E D
Fixed Equipment Anchorage
Office of Statewide Health Planning and Development
OPA-0485 November 14, 2002
*** Valid for 3 Years Maximum ***
Bill Staehlin (916)324-9106

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Original Sep-02
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Directory - ISAT Rigid Brace Assemblies

ISAT Brace Assembly	Rod Diameter	ISAT Seismic Brackets: Lower Bracket	Upper Bracket	Brace Arm	Maximum Brace Arm Length	Maximum Brace Reaction - P(lbs): To Rod	Not To Rod
R1	3/8"	RCHW38	ABHW	Single Strut	9'	950	950
R1.1		RCHW38X	ABHW	Single Strut	9'	1,115	1,860
R2		RCHW38	ABHW	Double Strut	10'	950	950
R2.1		RCHW38X	ABHW	Double Strut	10'	1,115	1,860
R3	1/2"	RCHW12	ABHW	Single Strut	9'	950	950
R3.1		RCHW12X	ABHW	Single Strut	9'	1,860	1,860
R3.2		RCHW12X	RCHW12X	Single Strut	9'	1,988	1,988
R4		RCHW12	ABHW	Double Strut	10'	950	950
R4.1		RCHW12X	ABHW	Double Strut	10'	1,860	1,860
R4.2		RCHW12X	RCHW12X	Double Strut	10'	2,060	2,185
R5		ABF12	ABF12	Single Strut	9'	1,865	1,865
R6		ABF12	ABF12	Double Strut	10'	1,865	1,865
R7	5/8"	RCHW58	ABHW	Single Strut	9'	1,860	1,860
R8		RCHW58	ABHW	DoubleStrut	10'	1,860	1,860
R9		RCHW58	RCHW58	Single Strut	9'	1,988	1,988
R10		RCHW58	RCHW58	DoubleStrut	10'	2,185	2,185
R11	3/4"	RCHW34	ABHW	Single Strut	9'	1,860	1,860
R12		RCHW34	ABHW	Double Strut	10'	1,860	1,860
R13		RCHW34	RCHW58	Single Strut	9'	1,988	1,988
R14		RCHW34	RCHW58	Double Strut	10'	2,185	2,185
R17	7/8"	RCHW78	ABHW	Single Strut	9'	1,860	1,860
R18		RCHW78	ABHW	Double Strut	10'	1,860	1,860
R19		RCHW78	RCHW58	Single Strut	9'	1,988	1,988
R20		RCHW78	RCHW58	Double Strut	10'	2,185	2,185
R21	NA	ABF34	ABF34	Single Strut	9'	1,988	1,988
R22	NA	ABF34	ABF34	Double Strut	10'	3,335	3,335
R23	1"	RCHW100	ABHW	Single Strut	9'	1,860	1,860
R24		RCHW100	ABHW	Double Strut	10'	1,860	1,860
R25		RCHW100	RCHW58	Single Strut	9'	1,985	1,985
R26		RCHW100	RCHW58	Double Strut	10'	2,185	2,185
R29	NA	ABHW	ABHW	Single Strut	9'	1,860	1,860
R30	NA	ABHW	ABHW	Double Strut	10'	1,860	1,860

1. Seismic Brackets Per ICBO Report # PFC5566 (excluding RCHW78, RCHW100).
   Use of Any Substitute Bracket Voids Engineering.
2. Single Strut: 1-5/8" x1-5/8", 12 ga., elongated holes. Double Strut: 1-5/8"x3-1/4", 12 ga, elongated holes
3. Typical Rigid Brace Arm Assembly Details, Page E2.
4. Tube Steel 2-1/2" x 2-1/2" x 3/16" x Max. 15' Suitable For Any Rigid Brace Arm Where F < 2,100#.
   Tube Steel 3-1/2" x 3-1/2" x 3/16" x Max. 20' Suitable For Any Rigid Brace Arm Where F < 2,100#.

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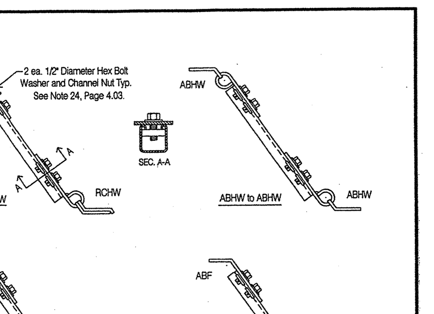

TYPICAL RIGID BRACING BRACKET ASSEMBLY COMBINATIONS
SINGLE OR DOUBLE CHANNEL

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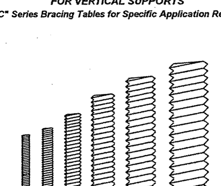
ALL-THREAD ROD
FOR VERTICAL SUPPORTS
Refer To "C" Series Bracing Tables for Specific Application Requirements



Rod Diameter (in.)	(mm)	Min. ASTM A36 Steel: High Temperature Applications Maximum Design Value (lbs.)	(kgs)	Standard Pipe & Conduit Applications Maximum Design Value (lbs.)	(kgs)
3/8"	10	610	277	790	359
1/2"	13	1,130	513	1,460	663
5/8"	16	1,810	822	2,340	1,062
3/4"	19	2,710	1,230	3,500	1,589
7/8"	21	3,770	1,712	4,860	2,206
1"	25	4,960	2,252	6,400	2,906
1-1/8"	29	6,230	2,828	8,000	3,632
1-1/4"	32	8,000	3,632	10,300	4,676
		ASME B31.1 Rod Temp of 650 Deg.		ANSI B31.9	

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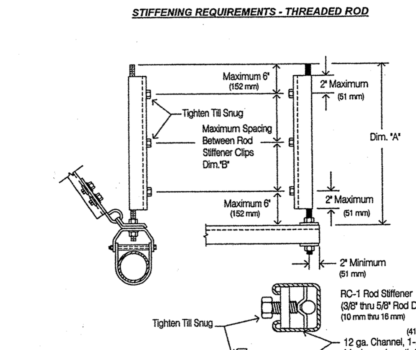
STIFFENING REQUIREMENTS - THREADED ROD



Rod Stiffener Chart

Threaded Rod Diameter	Dim. "A" Maximum Rod Length Without Stiffener	Dim. "B" Maximum Spacing Between Rod Stiffeners
(mm)	(mm)	(mm)
3/8" (10)	16" (406)	13" (330)
1/2" (13)	22" (559)	18" (457)
5/8" (16)	28" (711)	23" (584)
3/4" (19)	34" (863)	28" (711)
7/8" (21)	40" (1,016)	33" (838)
1" (25)	46" (1,168)	38" (965)

NOTICE: Rod Stiffening Required Only For Hanger Rods To Which Seismic Bracing Has Been Installed.

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MAXIMUM TRAPEZE SUPPORT LOADS

SINGLE CHANNEL* (12 ga., 1-5/8" x 1-5/8")

MAXIMUM SPAN	MAX. TOTAL UNIFORM LOAD LBS	DEFLECTION INCHES
18"	2,150	0.03
24"	1,610	0.06
36"	1,080	0.13
48"	810	0.22
60"	650	0.35
72"	540	0.50
84"	460	0.69
96"	400	0.90
108"	360	1.14
120"	320	1.40

DOUBLE CHANNEL* (12 ga., 1-5/8" x 3-1/4")

MAXIMUM SPAN	MAX. TOTAL UNIFORM LOAD LBS	DEFLECTION INCHES
18"	3,130	0.02
24"	3,130	0.03
36"	3,020	0.07
48"	2,270	0.13
60"	1,810	0.20
72"	1,510	0.28
84"	1,290	0.39
96"	1,130	0.50
108"	1,010	0.64
120"	910	0.79

* Solid Channel. For Channel With 9/16" Diameter Holes, Reduce Uniform Load 10%.
For Concentrated Load at Center of Span, Divide Uniform Load by 2 and Multiply Deflection by 0.8.
For OSHPD Projects, Double Channel To Be Fillet Welded. See Page G 3.1.

TUBE STEEL (2-1/2" x 2-1/2" x 3/16")

MAXIMUM SPAN	MAX. TOTAL UNIFORM LOAD LBS	DEFLECTION INCHES
18"	13,860	0.03
24"	10,400	0.05
36"	6,930	0.11
48"	5,190	0.20
60"	3,960	0.28
72"	3,020	0.40
84"	2,570	0.54
96"	2,240	0.70
108"	1,990	0.88
120"	1,780	1.08

TUBE STEEL (3-1/2" x 3-1/2" x 3/16")

MAXIMUM SPAN	MAX. TOTAL UNIFORM LOAD LBS	DEFLECTION INCHES
18"	29,790	0.02
24"	22,320	0.04
36"	14,940	0.08
48"	11,160	0.14
60"	8,910	0.22
72"	7,470	0.32
84"	5,580	0.38
96"	4,860	0.50
108"	4,320	0.63
120"	3,870	0.78

STEEL ANGLE (3" x 3" x 1/4")

MAXIMUM SPAN	MAX. TOTAL UNIFORM LOAD LBS	DEFLECTION INCHES
18"	4,900	0.01
24"	3,700	0.02
36"	2,400	0.05
48"	1,800	0.08

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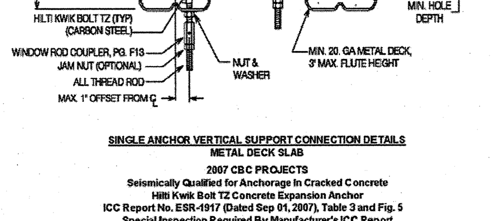
NOTE:

-DO NOT UTILIZE EXISTING ROD HANGERS @ SEISMIC LOCATIONS.
INSTALL NEW ROD HANGERS @ SEISMIC LOCATIONS PER OPA-0485.

-FOR BRACE REACTIONS ON SB-2.0 LEGEND OF 1500 OR LESS, UTILIZE G6.1TZ, ½" HILTI-TZ WITH 3-1/4" MIN EMBEDMENT
-FOR BRACE REACTIONS ON SB-2.0 LEGEND OF 1500 TO 2500, UTILIZE G6.1TZ, ⅝" HILTI-TZ WITH 4" MIN EMBEDMENT



SINGLE ANCHOR VERTICAL SUPPORT CONNECTION DETAILS
METAL DECK SLAB
2007 CBC PROJECTS
Seismically Qualified for Anchorage In Cracked Concrete
Hilti Kwik Bolt TZ Concrete Expansion Anchor
ICC Report No. ESR-1917 (Dated Sep 01, 2007), Table 3 and Fig. 5
Special Inspection Required By Manufacturer's ICC Report

Anchor Diameter Inch	Design Tension 4 ksi Conc. Lbs.	Design Tension 3 ksi Conc. Lbs.	Minimum Hole Depth [1] Inch	Minimum Effective Embedment [2] Inch	Installation Torque Ft-Lbs.	Minimum Anchor Spacing Inch	Minimum Edge Distance Inch	Min. Concrete Thickness Above Top Flute (Inch), Metal Deck Flute Height: 1 1/2"	2"	3"
3/8	776	672	2 5/8	2	25	6 3/4	5	2 1/4	1 3/4	1 1/2
1/2	776	672	2 5/8	2	40	6 3/4	5 1/2	2 1/4	1 3/4	1 1/2
1/2	1,393	1,206	4	3 1/4	40	9 3/4	7 1/2	3 1/2	3	2
5/8	2,469	2,138	4 3/4	4	60	12	8 3/4	4 1/2	3 3/4	2 3/4

1. MINIMUM HOLE DEPTH IS TO BE VERIFIED BY THE INSPECTOR.
2. MINIMUM EFFECTIVE EMBEDMENT IS AFTER THE ANCHOR HAS BEEN SET.

SINGLE HILTI KWIK BOLT TZ ANCHOR
VERTICAL SUPPORT CONNECTION

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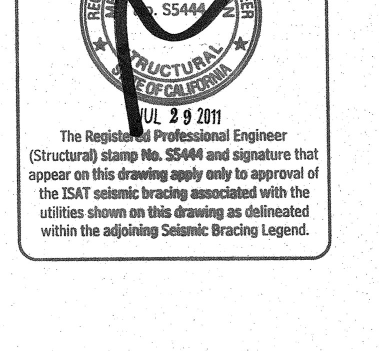

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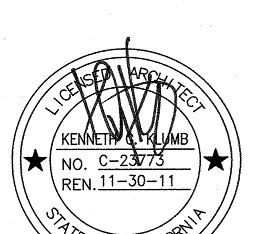
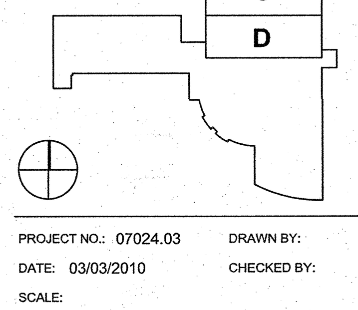


NO.	ISSUES/REVISONS	DATE
	OSHPD SUBMITTAL	03/03/10
1	SOLANO CO. DRM SUBMITTAL	05/10/10
2	OSHPD 1ST ROUND BACKCHECK RESPONSES	10/28/10
3	OSHPD 2ND ROUND BACKCHECK RESPONSES	04/28/11
4	OSHPD 3RD ROUND BACKCHECK RESPONSES	07/27/11
7	CHANGE ORDER #03	07/29/11

NORTHBAY™ HEALTHCARE

VACAVALLEY HOSPITAL
EXPANSION PROJECT
PACKAGE 3
OSHPD No. HS081331

KEY PLAN



PROJECT NO.: 07024.03 DRAWN BY:
DATE: 03/03/2010 CHECKED BY:
SCALE:

SHEET TITLE:

SEISMIC DETAIL SHEET
SEISMIC BRACING

SHEET NO: SB-1.1

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