

Robinson Meier Juilly & Associates Principals Peter Robinson, S.E. Jayson E. Haines, S.E.



Structural Drawings For Seismic Anchorage

Prepared for:

Schneider Electric November 17, 2016 RMJ Job No. 14109 Valid Thru December 31, 2017

241 Joaquin Avenue San Leandro, CA 94577 (510) 991-0977



GENERAL NOTES

DESIGN

This Design and design forces are based on 2012 IBC.

This Document may only be used with the express written consent of the manufacturer listed below for the specific project site and installation location. This document is invalid without such consent.

Desian Criteria:

Importance Factor1.5

Maximum Value of $S_{DS}=2.0$, $a_P=1.0$, $R_P=2.5$, $\Omega_0=2.5$ (As reg'd for anchorage to concrete), z/h=0.0(Concrete slab on grade), z/h=0.5 (For Upper Levels)

Forces per ASCE 7-10 section 13.3.1, Equations 13.3-1, 13.3-2 & 13.3-3.

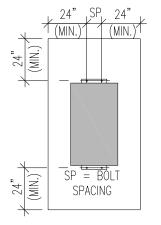
Note: For Site Specific Sps, SEOR shall determine appropriate value to be utilized.

<u>Dimensions</u>: Refer to rough concrete surfaces, or top of slab, unless otherwise indicated.

Fasteners Expansion Anchors:

Anchor Diameter		Min. f'c (psi)	Anchor Type	ICC Report No.	Min. Embed.	Min. Spacing		Min. Conc. Thickness		Direction Tension
1/2"	Normal Weight		Hilti Kwik Bolt CS	ESR-1917	31/4"	6 ¹ / ₂ "	24"	6"	40 FT-LB	2,600 lb

Tension testing shall be done in the presence of the special inspector and a report of the test results shall be submitted to SEOR (After at least 24 hours have elapsed since installation, direct pull tension test or torque test at least 50% of the anchors.) Testing shall be done in the presence of Special Inspector, and a report shall be submitted to the enforcement agency.



TYPICAL CONCRETE EDGE DETAIL

<u>Acceptance Criteria</u>:

Direction Tension Test:

Anchor shall have maintain test load of (15) seconds & shall exhibit no discernable movement during the tension test, e.g., as evidenced by loosening of the washer under the nut.

Torque Test:

The applicable torque must be achieved within the following limits: wedge type: 1/2 turn of the nut.

Signed by MAS

*If any anchor fails testing, all anchors of the same type shall be tested, which are install by the same trade, not previously tested until twenty (20) consecutive anchors pass, then resume initial test frequency.



11.2016

Job No.

RMJ
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Structural Engineers 241 Joaquin Avenue San Leandro CA 94577 510.991.0977

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NETSHELTER SX ANCHORAGE	14109.01
LOW, MODERATE, AND HIGH	Sheet No.
SEISMIC REGIONS	(SK1)

Date

Test Loads:

Calculations are in accordance with the 2012 International Building Code and 2013 California Building Code.

The details are applicable to locations in the United States of California where S_{DS} is not greater than 2.0. For site specific S_{DS} , SEOR shall determine appropriate value to be utilized. Locations determined to be risk category IV not covered under this package.

Anchor forces shown on the drawings are factored loads that shall be used for strength design.

Package only covers only the supports & attachments of the unit to the structure.

RESPONSIBILITY OF STRUCTURAL ENGINEER OF RECORD

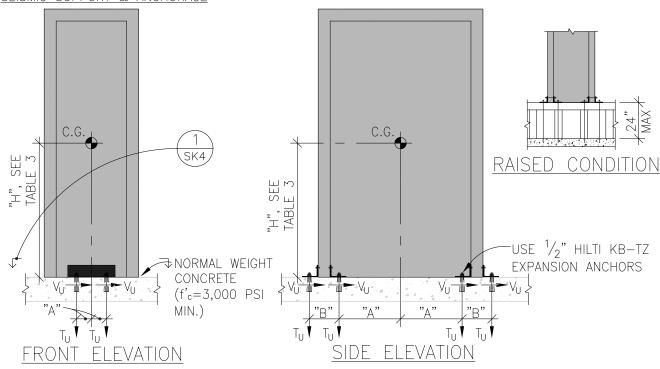
- 1. Verify that the concrete meets the requirements of the applicable ICC ESR.
- 2. Verify that the anchors are at an adequate distance from any slab opening or edges.
- 3. Verify that all new or existing anchors are at an adequate distance from the anchors shown in this pre-approval. The SEOR shall verify that there is no adverse interaction where other anchors are within 18" or 6 h_{ef} from the unit's anchors.
- 4. Verify the adequacy of the structure to support the weight and forces shown in this pre—approval in addition to all other weights and forces that are imposed on it.
- 5. Provide any supplementary structure required for strength and stability.
- 6. Verify that the installation is in conformance with the 2012 IBC and with the notes and details shown in this pre-approval. Verify that the equipment's actual weight, center of gravity location, anchor locations, anchor details and the material and gage of the unit where attachments are made conform with the information shown in this pre-approval.
- 7. If content weight is less than 33 pcf, maximum live loads permitted shall be posted.



(SK2



SEISMIC SUPPORT & ANCHORAGE



NOTES:

- 1. DESIGN CENTER OF GRAVITY AT 2/3 THE HEIGHT OF THE UNIT. (NOTE: ACTUAL CENTER OF GRAVITY DOES NOT EXCEED DESIGN HEIGHT.)
- 2. FORCES ARE DETERMINED PER 2012 INTERNATIONAL BUILDING CODE AND ASCE 7-10 STRENGTH DESIGN. ($S_{DS}=2.0(HIGH\ SEISMIC)\ 1.0(LOW\ SEISMIC),\ \alpha_p=1.0,\ l_p=1.5,\ R_p=2.5,\ \Omega_0=2.5,\ z/h=0$ (GROUND LEVEL) & z/h=.5 (50% OF BLDG. HT.)).
- 3. SEE GENERAL NOTES FOR ALL OTHER CONDITIONS AND LIMITATIONS.
- 4. NETSHELTER SX EXTERIOR CABINET UNIT COVER COMPOSED OF 14 ga COLD ROLLED STEEL 29.4 ksi.
- 5. SIGN MUST BE POSTED INDICATING CABINET TOTAL WT. LIMITS LISTED IN THE TABLE 1.
- 6. WEIGHTS LISTED IN "TABLE 1" APPLY TO ALL UNITS IRRESPECTIVE OF SIZE.

ALLOWABLE CABINET ADDED WEIGHT *ALL WEIGHTS GIVEN IN (LB) TABLE 1

ALLOWABLE CA	ARINE! A	BINEL ADDED MEIGHT FALL MEIGHTS GIVEN IN (TR) <u>TARLE T</u>						RLF I	_
MAX	LOW &	: MODER	ATE SEI	SMIC	НІ	GH SEIS	MIC		
CABINET WT.	GRO	GROUND		UPPER		GROUND		PER	
(500)	ON	RAISED	ON	N RAISED C		RAISED	ON	RAISED	DOFFSS/O
	FLOOR		FLOOR		FLOOR		FLOOR		PROFESS/ONAL
SINGLE UNIT	1,500	850	1,200	1,200	1,000	SS ¹	1,200	1,200	JON E. HAM
GANGED UNIT	2,000	2,000	1,200	1,200	1,500	1,500	1,200	1,20 \)	
(INCLUDES Ω_0	FOR ANCHORAGE TO CONCRET				E)			\	120 NE 48 DI TE
DIMENSIONS, A	AND DEM	MAND LO	ADING (TABLE 2	_)				Exp. 12/31/2017
COVERS ALL	SCHNEIL	DER ELE	CTRIC	C	CABINET	DIMENSI	ONS		
NETSHELTER	SX UNIT	S WITH-	-IN W	IDTH (in.	.) LEN	GTH (in.			ALCTURIANT!
THE FOLLOWI	ng dime	NSIONS	2.5	3.6-31.5	42.1	1-47.2	47.17-	-99.6	OF CALIFORNIA



NOTES:

*POSITION BOLTS IN OUTER OR UPPER HALF OF SLOTTED BOLT HOLES WHERE APPLICABLE

*SEE MANUFACTURE DRAWINGS FOR EXACT DIMENSIONS OF NETSHELTER SX CABINETS. AR3100 SHOWN FOR REFERENCE. *HIGH SEISMIC BRACKET INSTALLATION SHOWN HERE. CLIENT HAS OPTION TO USE INTERNAL OR EXTERNAL BRACKET INSTALLATION FOR LOW AND MODERATE SEISMIC REGIONS.

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CONDITION SCHEDULE

CONDITION	<u>SEE</u>
CONCRETE SLAB	SK6
CONCRETE FILL OVER METAL DECK	SK7
RAISED COMP. FLOOR CONC. FILL METAL DECK	SK8
RAISED COMP. FLOOR CONC. SLAB	SK9

¹/₂"ø HILTI KB-TZ EXPANSION ANCHOR (SEE BOLT REQUIREMENTS)

> - VERTICAL SUPPORT ELEMENT 16 GA ASTM A1008-13 SHS GRADE 41

BOLT REQUIREMENTS

1. USE 8 BOLTS PER CABINET FOR HIGH SEISMIC. 2. USE 4 BOLTS PER CABINET FOR LOW AND MODERATE SEISMIC.

INTERNAL AND SEISMIC)

BRACKET MATERIAL (0.135" THK, EXTERNAL BRACKET ASTM A1008-13 SHS GRADE 41) INSTALLATION (HIGH w/ M6 (ISO 898-1 CLASS 10.9) BOLTS PROVIDED BY NETSHELTER.

SINGLE UNIT BOTTOM PLAN VIEW

N.T.S.



BRACKET INSTALLATION:

FOR LOW & MODERATE CONDITIONS CUSTOMER MAY CHOOSE EITHER INTERNAL OR EXTERNAL BRACKET INSTALLATION SEE SK10.

FOR HIGH SEISMIC CONDITIONS BOTH BRACKETS ARE REQUIRED SEE SK13.

ANCH	ЭR	BC)LT	DI	MENSIC	NS	<u>TABLE</u>	<u>3</u>
22 22	"	,,	"	,,	22 - 22		22 - 22	

"H"	"A"	"B"	"C"	"D"		
MAX	MAX	MAX	MAX	MAX		
(in.)	(in.)	(in.)	(in.)	(in.)		
59.3"	3.74"	5.9"	15.03"	15.75"		
WORST CASE VALUES						



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Sheet No.

(SK4)

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NETSHELTER SX ANCHORAGE
LOW, MODERATE, AND HIGH
SEISMIC REGIONS

Date

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NOTES:

*POSITION BOLTS IN OUTER OR UPPER HALF OF SLOTTED BOLT HOLES WHERE APPLICABLE

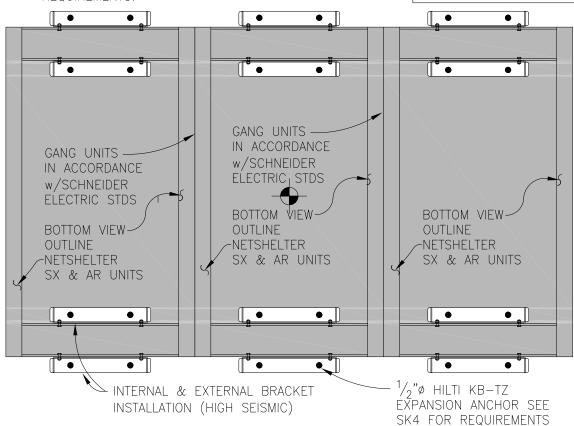
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INSTALLATION FOR THE FOLLOWING CONDITIONS:

 SEE BOLT REQUIREMENTS ON SK4 FOR ANCHORAGE REQUIREMENTS.

CONDITION SCHEDULE

CONDITION	SEE
CONCRETE SLAB	SK6
CONCRETE FILL OVER METAL DECK	SK7
RAISED COMP. FLOOR CONC. FILL METAL DECK	SK8
RAISED COMP. FLOOR CONC. SLAB	SK9



GANG UNIT BOTTOM PLAN VIEW (3 UNITS OR MORE GANGED TOGETHER)



BRACKET INSTALLATION:

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FOR HIGH SEISMIC CONDITIONS BOTH BRACKETS ARE REQUIRED SEE SK13.

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NETSHELTER SX ANCHORAGE
LOW, MODERATE, AND HIGH
SEISMIC REGIONS

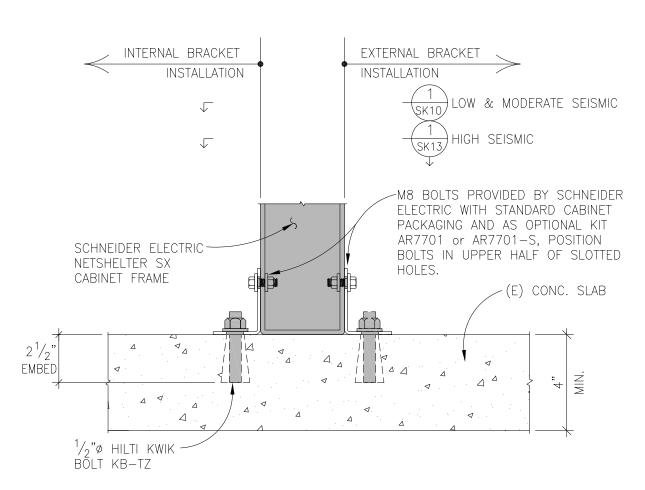
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CONCRETE SLAB INSTALLATION





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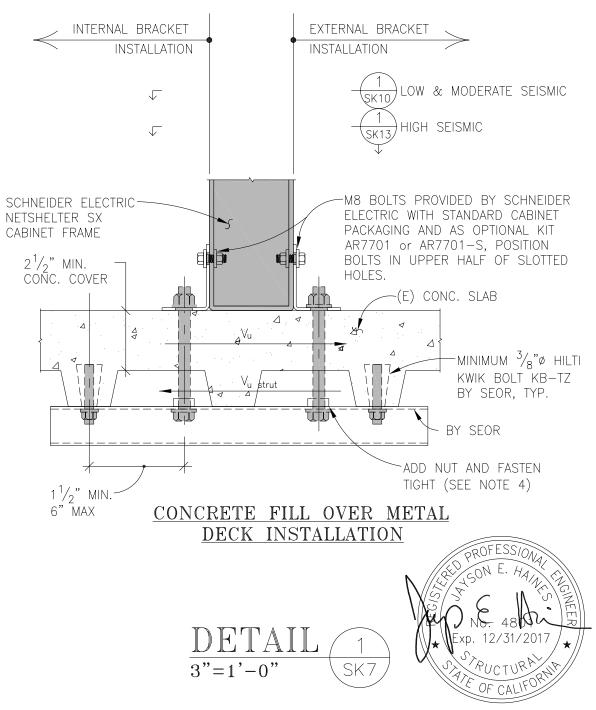
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NETSHELTER SX ANCHORAGE
LOW, MODERATE, AND HIGH
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SEISMIC REGIONS

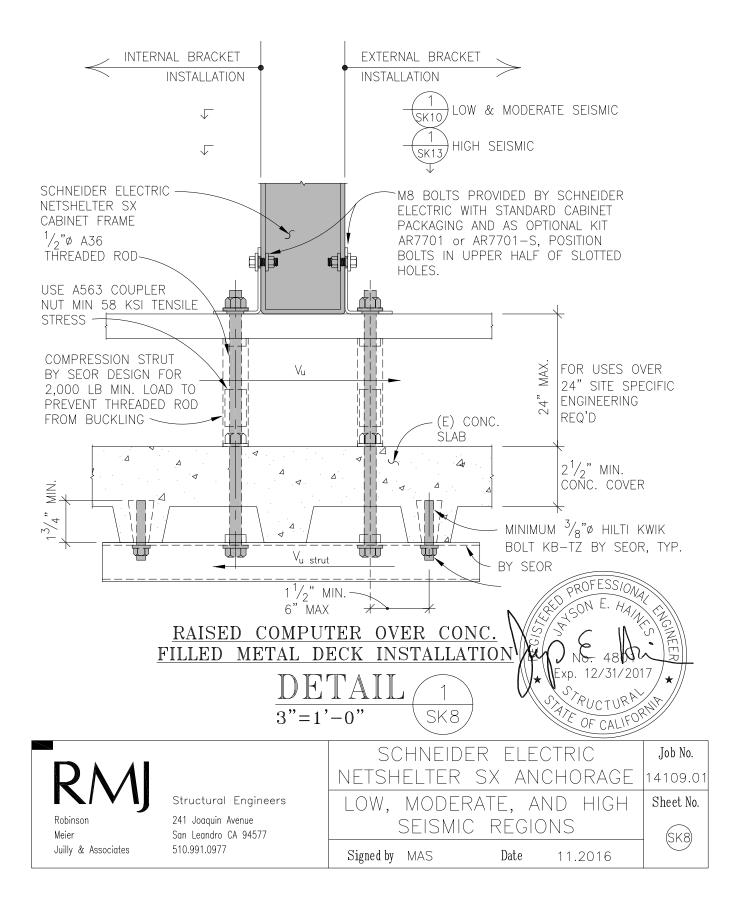
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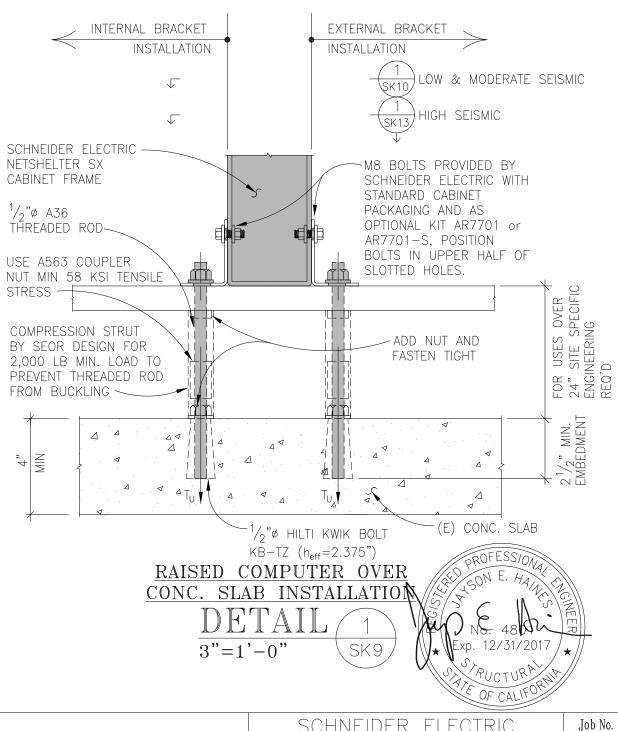
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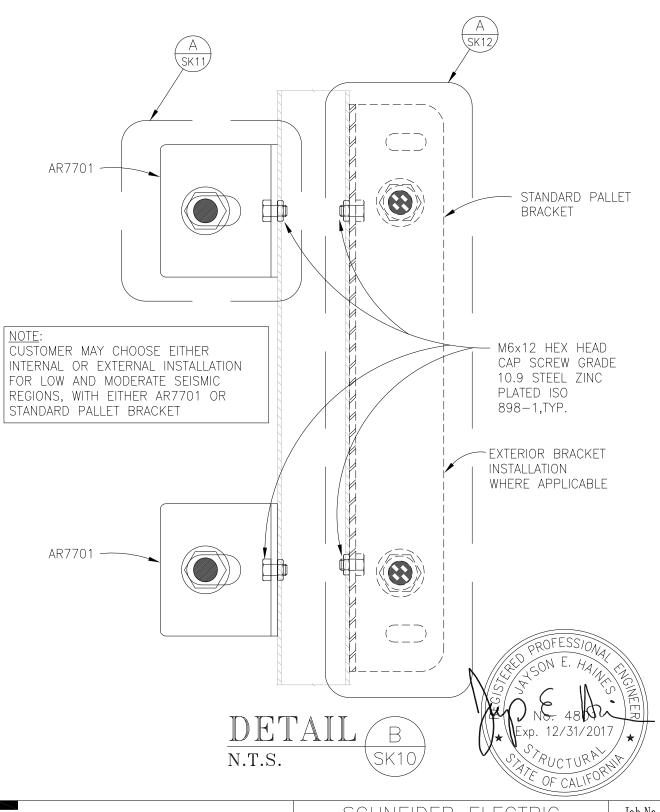
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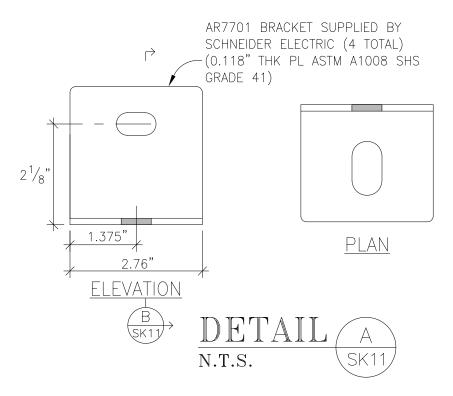
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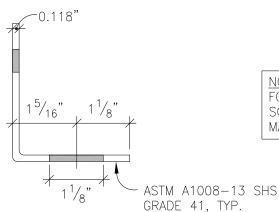
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AR7701 BRACKET FOR LOW AND MODERATE SEISMIC REGIONS



NOTE:

FOR EXACT BRACKET DIMENSION SEE SCHNEIDER ELECTRIC NETSHELTER SX MANUFACTURE DRAWINGS.

SECTION

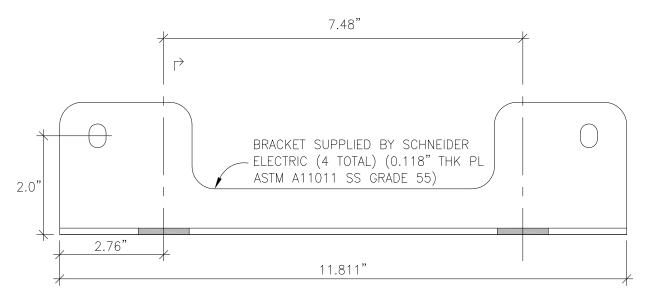
DETAIL

N.T.S.

SK11

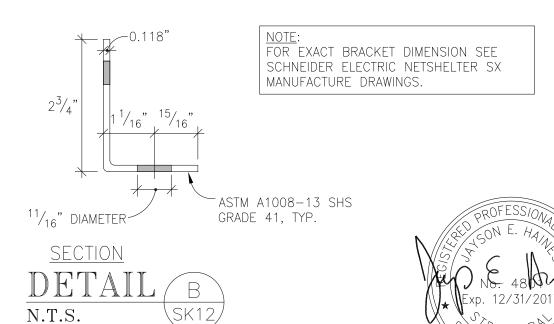


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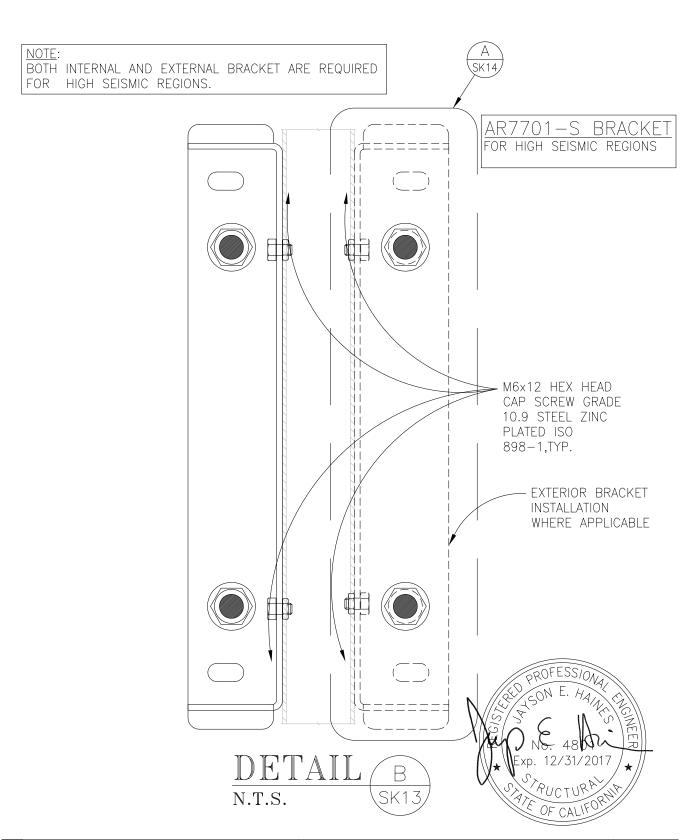




STD. PALLET BRACKET FOR LOW AND MODERATE SEISMIC REGIONS









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LOW, MODERATE, AND HIGH

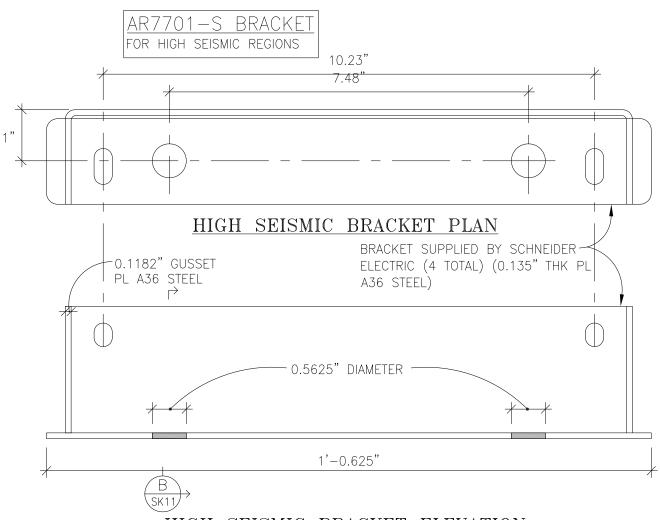
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HIGH SEISMIC BRACKET ELEVATION

