

**CHATSWORTH PRODUCTS, INC.**

DES. **J. ROBERSON**

SHEET

**3**

JOB NO. **11-1453**

**CUBE IT**

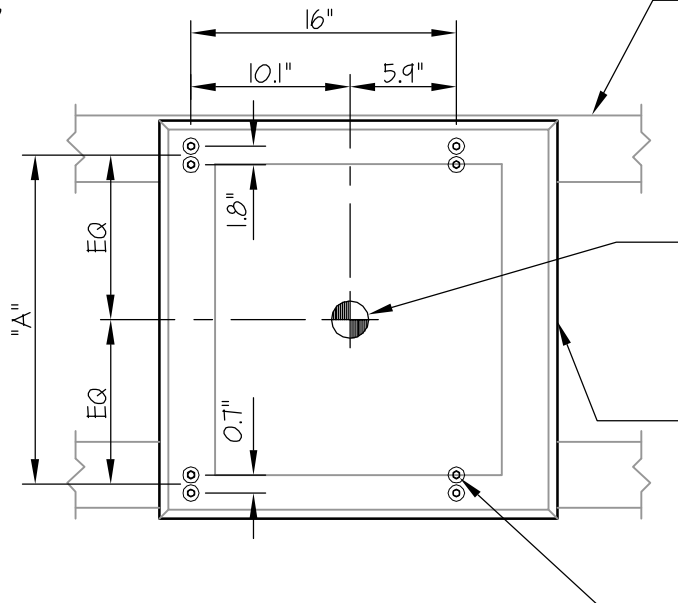
DATE **4/27/15**

OF **5** SHEETS

SEISMIC SUPPORTS & ATTACHMENTS

WALL MOUNTED

NOTE:  
THIS DETAIL APPLIES TO METAL STUD FRAMING REFER TO SHEET 4 OF 5 FOR WOOD STUD FRAMING AND SHEET 5 OF 5 FOR CONCRETE WALL ANCHORING DETAILS



STRUCTURAL ENGINEER OF RECORD SHALL DESIGN THE BACKING PLATE AND WALL STRUCTURE (16 GA. 50 ksi MIN.)

C.G. WT. = SEE SCHED SHEETS 4 & 5 OF 5)

UNIT BACKING IS 14 GA., 20 ksi (MIN) (ASTM A1008)

USE 8- 1/4"φ TEK SCREWS W 1/4" x 5/8" O.D. FENDER WASHERS TO BACKING PLATE OR DIRECTLY TO STEEL STUDS, THROUGH NON-SLOTTED HOLES IN UNIT BACK

FRONT ELEVATION

NOTES:

1. FORCES ARE DETERMINED PER 2013 CALIFORNIA BUILDING CODE AND ASCE 7-10

STRENGTH DESIGN IS USED. ( $S_{DS} = 2.20$ ,  $a_p = 1.0$ ,  $I_p = 1.5$ ,  $R_p = 2.5$ ,  $\Omega_o = 2.5$ ,  $z/h \leq 1$ )

HORIZONTAL FORCE ( $E_h$ ) =  $1.58 W_p$

HORIZONTAL FORCE ( $E_{mh}$ ) =  $3.96 W_p$  (FOR CONCRETE ANCHORAGE)

VERTICAL FORCE ( $E_v$ ) =  $0.44 W_p$

2. CENTER OF GRAVITY (C.G.) AND WEIGHT ARE THE GOVERNING PARAMETERS FOR DESIGN. THIS PREAPPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.

3. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN IN COMBINATION WITH ALL OTHER LOADS THAT MAY BE PRESENT.



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### CUBE IT

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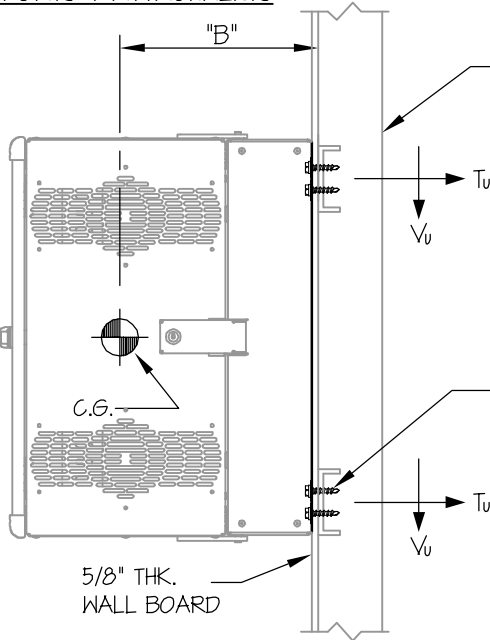
DATE **4/27/15**

SHEET

**4**

OF **5** SHEETS

SEISMIC SUPPORTS & ATTACHMENTS



STEEL STUD WALL SECTION

STRUCTURAL ENGINEER OF RECORD SHALL DESIGN THE BACKING PLATE AND WALL STRUCTURE (16 GA. 50 KSI MIN.)

USE 8- 1/4"Φ TEK SCREWS W/ 1/4" x 5/8" O.D. FENDER WASHERS TO BACKING PLATE OR DIRECTLY TO STEEL STUDS, THROUGH NON-SLOTTED HOLES IN UNIT BACK

5/8" THK. WALL BOARD

WALL MOUNTED

2 x STUDS OR 4 x BLKG (DOUGLAS-FIR LARCH NUMBER 2 MIN.) (DESIGNED BY STRUCTURAL ENGINEER OF RECORD)

USE 8- 1/4"Φ x 4" LAG SCREWS W/ 1/4" x 5/8" O.D. FENDER WASHERS TO WOOD STUD OR BLKG. (PRE-DRILL HOLES TO 70% SHANK DIAMETER) THROUGH NON-SLOTTED HOLES IN UNIT BACK

WOOD STUD WALL SECTION

MODEL NO.	"A" (in.)	"B" (in.)	WEIGHT (lb.)	T <sub>u</sub> (lb.)	V <sub>u</sub> (lb.)
11890-X24	18.39	9.63	267	158	87
11840-X24	18.39	12.63	278	206	91
11996-X24	18.39	15.63	289	260	94
11890-X36	30.62	9.63	287	139	94
11840-X36	30.62	12.63	300	180	98
11996-X36	30.62	15.63	314	228	102
11890-X48	42.87	9.63	307	134	100
11840-X48	42.87	12.63	323	174	105
* 11996-X48	42.87	15.63	339	220	111

\* THIS UNIT USED IN THE CALCULATION

#14 TEK SCREWS TO 16 GAGE, 50 KSI

ΦT = 418 LB/SCREW (TENSION)

ΦV = 362 LB/BOLT (SHEAR)

1/4" LAG SCREWS TO WOOD

ΦT = 717 LB/SCREW (TENSION)

ΦV = 191 LB/SCREW (SHEAR)

UNITY CHECK:

$$\left(\frac{T_u}{\Phi T}\right) + \left(\frac{V_u}{\Phi V}\right) \leq 1.0$$

$$\left(\frac{220}{717}\right) + \left(\frac{111}{191}\right) = 0.88 \leq 1.0 \therefore \text{O.K.}$$

LOADS: PER 2013 CALIFORNIA BUILDING CODE AND ASCE 7-10

STRENGTH DESIGN IS USED (S<sub>ds</sub> = 2.20, a<sub>p</sub> = 1.0, I<sub>p</sub> = 1.5, R<sub>p</sub> = 2.5, z/h ≤ 1.0)

WEIGHT = 339 LB.

HORIZONTAL FORCE (E<sub>h</sub>) = 158 W<sub>p</sub> = 536 LB.

VERTICAL FORCE (E<sub>v</sub>) = 0.44 W<sub>p</sub> = 149 LB.

SCREW FORCES: (SHEET METAL/WOOD FRAMING)

TENSION (T)

$$T_{u \text{ VERTICAL}} = \frac{(1.2(339\#) + 149\#)(15.63")(10.1")}{2 \text{ SCREWS } (44.12")(16")} = 64 \text{ LB/SCREW}$$

$$T_{u \text{ PARALLEL}} = \frac{536\#(15.63")}{4 \text{ SCREWS } (16")} = 131 \text{ LB/SCREW}$$

$$T_{u \text{ PERP.}} = \frac{536\#(10.1")}{4 \text{ SCREWS } (16")} = 85 \text{ LB/SCREW}$$

$$T_{u \text{ MAX}} = 64\# + (0.3)(85\#) + 131\# = 220 \text{ LB/SCREW (MAX)}$$

SHEAR (V)

$$V_{u \text{ MAX}} = \sqrt{\left(\frac{(1.2(339\#) + 149\#)(10.1")}{4 \text{ SCREWS } (16")}\right)^2 + \left(\frac{536\#}{8 \text{ SCREWS}}\right)^2} = 111 \text{ LB/SCREW (MAX)}$$

UNITY CHECK:

$$\left(\frac{T_u}{\Phi T}\right) + \left(\frac{V_u}{\Phi V}\right) \leq 1.0 \quad \left(\frac{220}{418}\right) + \left(\frac{111}{362}\right) = 0.83 \leq 1.0 \therefore \text{O.K.}$$

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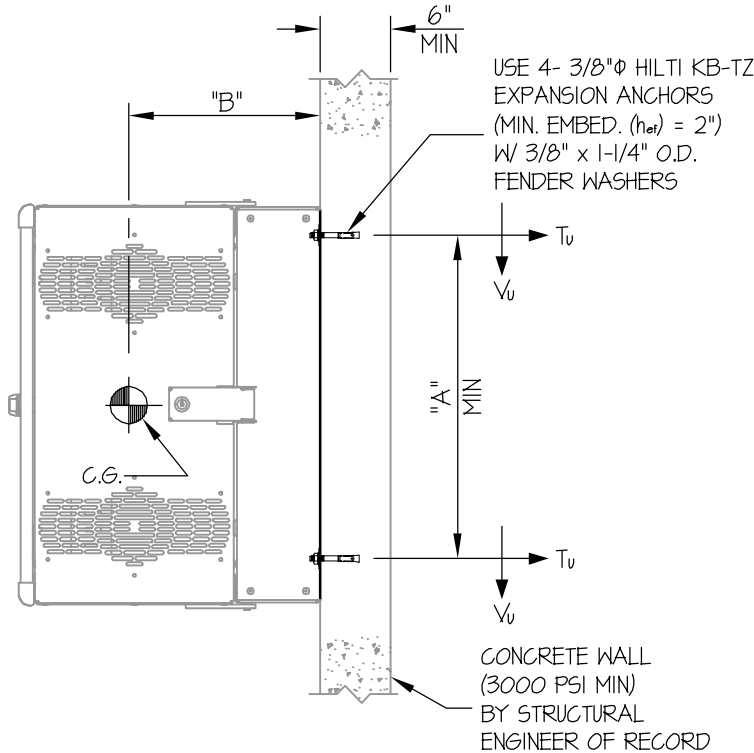
SHEET

**5**

OF **5** SHEETS

SEISMIC SUPPORTS & ATTACHMENTS

WALL MOUNTED



MODEL NO.	"A" (in.)	"B" (in.)	WEIGHT (lb.)	T <sub>u</sub> (lb.)	V <sub>u</sub> (lb.)
11890-X24	17.14	9	267	558	298
11840-X24	17.14	12	278	708	311
11996-X24	17.14	15	289	896	323
11890-X36	29.37	9	287	539	321
11184-X36	29.37	12	300	678	335
11996-X36	29.37	15	314	860	351
11890-X48	41.62	9	307	550	343
11840-X48	41.62	12	323	692	361
* 11996-X48	41.62	15	339	878	379

\* THIS UNIT USED IN THE CALCULATION

### CONCRETE WALL SECTION

LOADS: PER 2013 CALIFORNIA BUILDING CODE AND ASCE 7-10

STRENGTH DESIGN IS USED (S<sub>ds</sub> = 2.20, a<sub>p</sub> = 10, l<sub>p</sub> = 1.5, R<sub>p</sub> = 2.5, Ω<sub>o</sub> = 2.5, z/h ≤ 10)

WEIGHT = 339 LB.

HORIZONTAL FORCE (E<sub>mh</sub>) = 3.96 W<sub>p</sub> = 1342 LB.

VERTICAL FORCE (E<sub>v</sub>) = 0.44 W<sub>p</sub> = 149 LB.

BOLT FORCES: (CONCRETE)

TENSION (T)

$$T_{u \text{ VERTICAL}} = \frac{(1.2(339\#) + 149\#)(15\")(10.1\"){}}{1 \text{ BOLT } (41.62\")(16\"){}} = 121 \text{ LB/BOLT}$$

$$T_{u \text{ PARALLEL}} = \frac{1342\#(15\"){}}{2 \text{ BOLTS } (16\"){}} = 629 \text{ LB/BOLT}$$

$$T_{u \text{ PERP.}} = \frac{1342\#(10.1\"){}}{2 \text{ BOLTS } (16\"){}} = 424 \text{ LB/BOLT}$$

$$T_{u \text{ MAX}} = 121\# + (0.3)(424\#) + 629\# = 878 \text{ LB/BOLT (MAX)}$$

SHEAR (V)

$$V_{u \text{ MAX}} = \sqrt{\left(\frac{(1.2(339\#) + 149\#)(10.1\"){}}{2 \text{ BOLTS } (16\"){}}\right)^2 + \left(\frac{1342\#}{4 \text{ BOLTS}}\right)^2} = 379 \text{ LB/BOLT (MAX)}$$

BOLT SPECS: 3/8"φ HILTI KB-TZ

φT = 0.75φN<sub>t</sub> = 1212 LB/BOLT (TENSION)

φV = φV<sub>n</sub> = 1466 LB/BOLT (SHEAR)

UNITY CHECK:

$$\left(\frac{T_u}{\phi T}\right) + \left(\frac{V_u}{\phi V}\right) \leq 1.2$$

$$\left(\frac{878}{1212}\right) + \left(\frac{379}{1466}\right) = 0.98 \leq 1.2 \therefore \text{O.K.}$$