

CHATSWORTH PRODUCTS, INC.

6" DEEP RACK

DES. J. ROBERSON

JOB NO. 11-1131

DATE 8/16/12

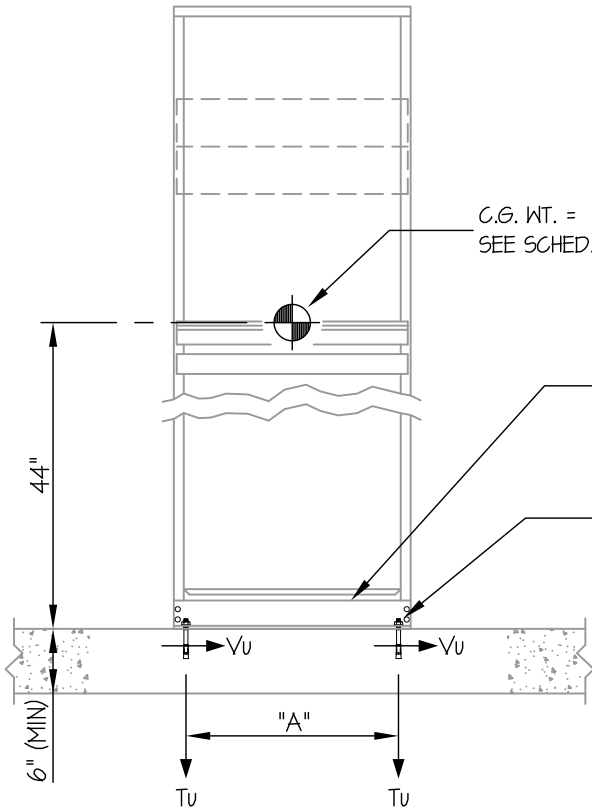
SHEET

1

OF **4** SHEETS

SEISMIC ANCHORAGE

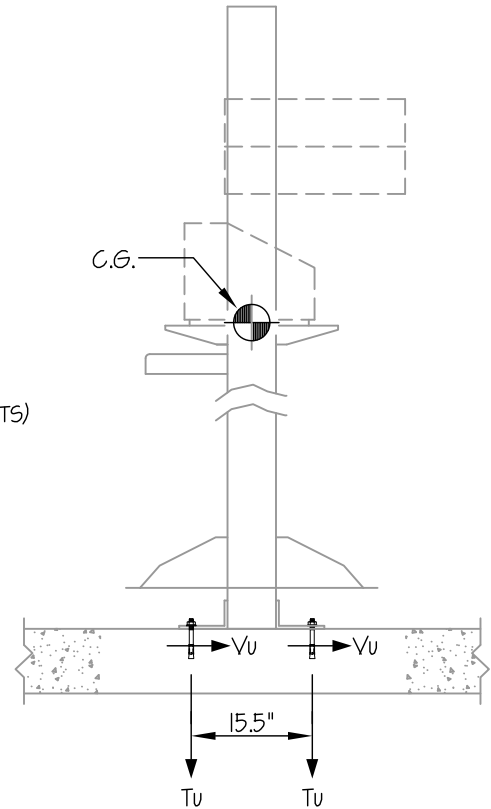
CONCRETE SLAB



RACK BASE ANGLE ASSY.
1/8" THK. (A36) (MIN.)
(BY CHATSWORTH PRODUCTS)

USE 4- 1/2" HILTI KB-TZ
EXPANSION ANCHORS
(MIN. EMBED. (h_{ef}) = 3.25")

FRONT ELEVATION



SIDE ELEVATION

NOTES:

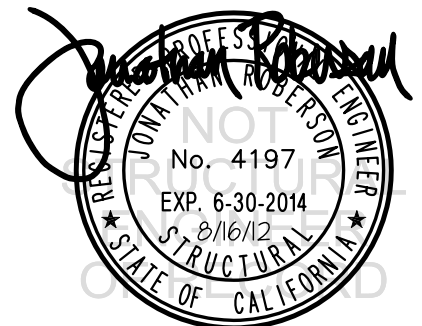
1. FORCES ARE DETERMINED PER 2010 CALIFORNIA BUILDING CODE AND ASCE 7-05 STRENGTH DESIGN IS USED.

HORIZONTAL FORCE (E_h) = $1.20 W_p$ ($S_{Ds} = 2.00, a_p = 2.5, I_p = 1.5, R_p = 2.5, z/h = 0.0$)

VERTICAL FORCE (E_v) = $0.40 W_p$

2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.

3. STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



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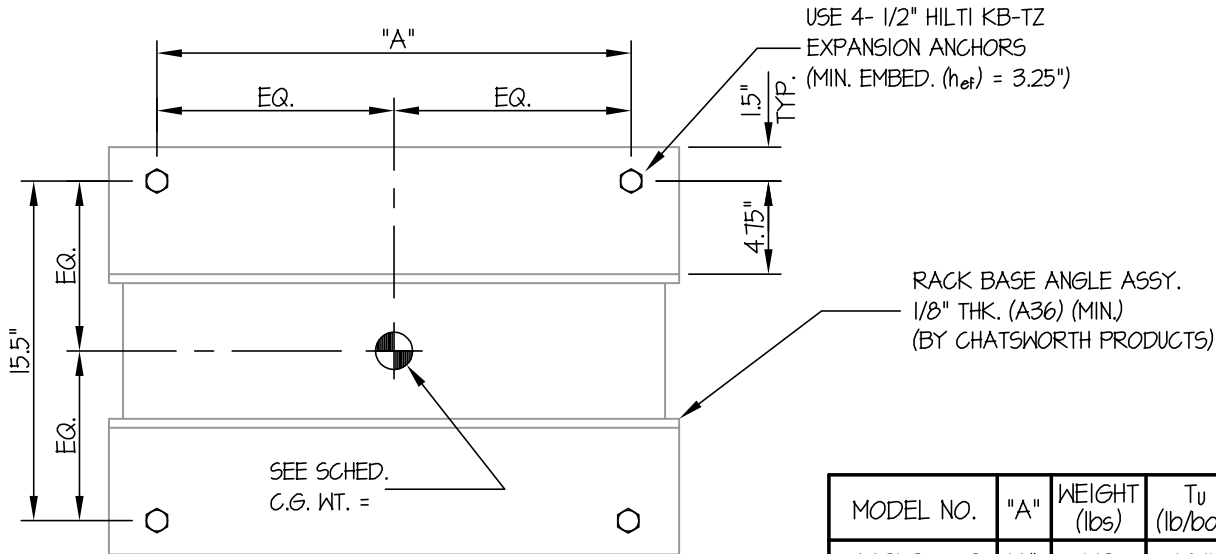
SHEET

2

OF **4** SHEETS

SEISMIC ANCHORAGE

CONCRETE SLAB



PLAN VIEW

MODEL NO.	"A"	WEIGHT (lbs)	T _U (lb/bolt)	V _U (lb/bolt)
* 66353-X03	16"	173	1495	104
66363-X03	32"	175	1329	105

* MODEL REPRESENTED IN CALCULATION BELOW

LOADS: PER 2010 CALIFORNIA BUILDING CODE AND ASCE 7-05

(STRENGTH DESIGN IS USED) (S_{Ds} = 2.00, a_p = 2.5, l_p = 1.5, R_p = 2.5, z/h = 0.0)

WEIGHT = 173 LB

HORIZONTAL FORCE (E_h) = 1.20W_p = 208 LB

VERTICAL FORCE (E_v) = 0.40W_p = 69 LB

BOLT FORCES:

TENSION (T)

$$T_U \text{ MAXIMUM} = \left[\frac{208\#(44")}{2\text{BOLTS}(16")} \times (0.3) \right] + \frac{208\#(44")}{2\text{BOLTS}(15.5")} - \frac{173\#(0.9) - 69\#}{4\text{BOLTS}} = 359 \text{ LB/BOLT (MAX)}$$

(HORIZ - SIDE TO SIDE) (HORIZ - FRONT TO BACK) (WEIGHT (0.9) - E_v)

SHEAR (V) (ASSUMES HALF THE NUMBER OF BOLTS)

$$V_U \text{ MAXIMUM} = \frac{208\#}{2 \text{ BOLTS}} = 104 \text{ LB/BOLT (MAX)}$$

PRYING

$$M_{\text{PRYING}} = 359\#(4.75") = 1705"\#$$

$$T_{\text{PRYING}} = 1705"\#/1.5" = 1137"\#$$

$$T_{\text{MAX}} = 1137"\# + 359\# = \underline{1495 \text{ LB/BOLT (MAX)}}$$

UNITY CHECK:

$$\left(\frac{T_U}{\phi T} \right) + \left(\frac{V_U}{\phi V} \right) \leq 12 \quad \left(\frac{1495}{2396} \right) + \left(\frac{104}{3400} \right) = 0.65 \leq 12 \therefore \text{OK}$$

BOLT SPECS : 1/2"ϕ HILTI KB-TZ (h_{ef}=3.25")

ϕT=0.75ϕNn = 2396 LB/BOLT (TENSION)

ϕV=0.75ϕVn = 3400 LB/BOLT (SHEAR)

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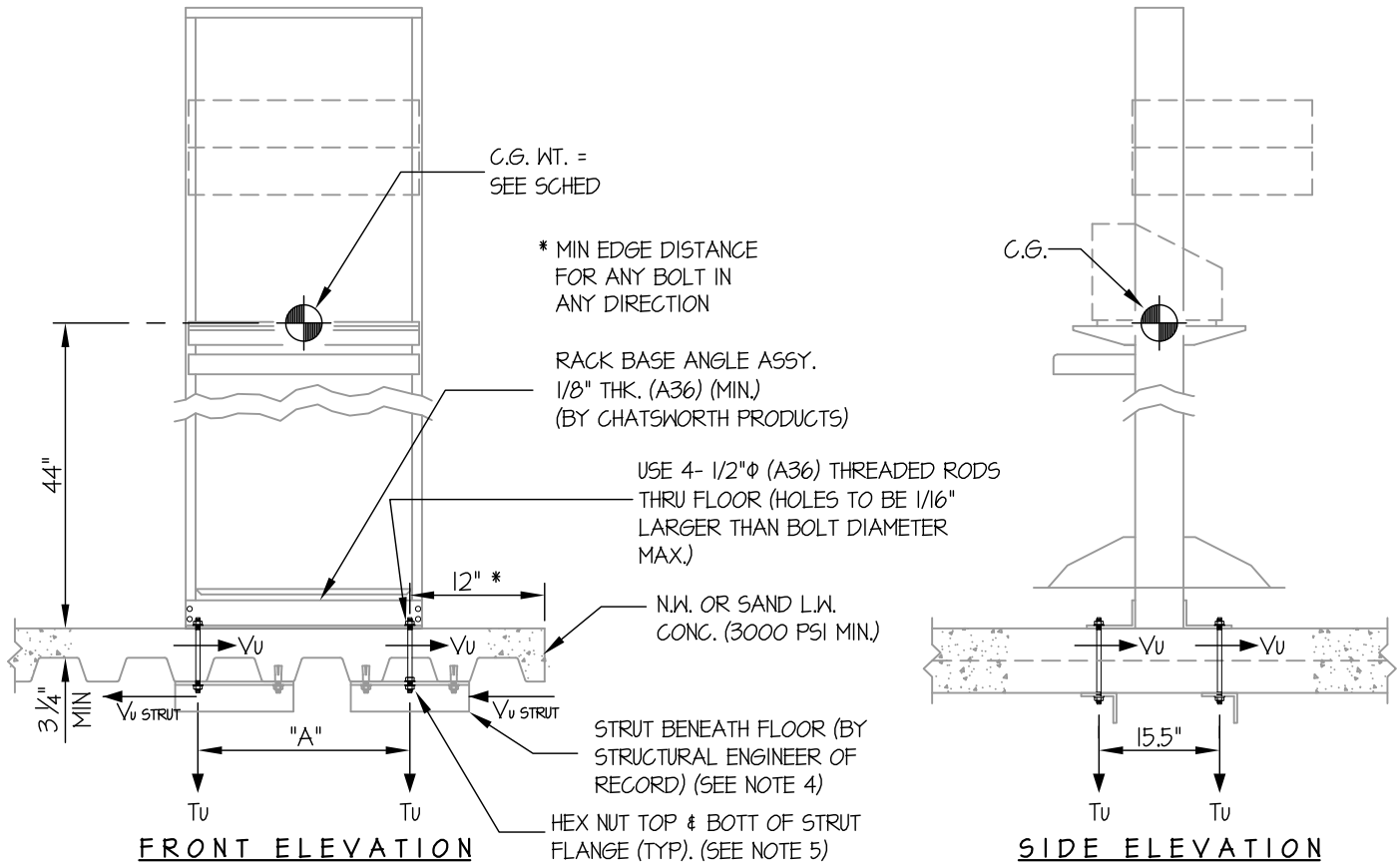
SHEET

3

OF **4** SHEETS

SEISMIC ANCHORAGE

CONCRETE SLAB ON METAL DECK



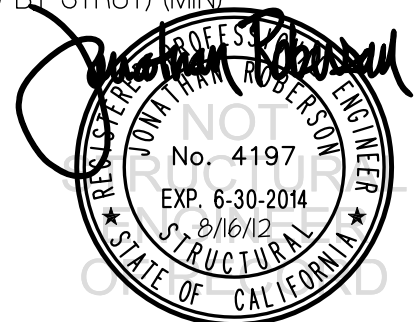
NOTES:

- FORCES ARE DETERMINED PER 2010 CALIFORNIA BUILDING CODE AND ASCE 7-05 STRENGTH DESIGN IS USED.

HORIZONTAL FORCE (E_h) = $3.60 W_p$ ($S_{ds} = 2.0$, $\alpha_p = 2.5$, $I_p = 1.5$, $R_p = 2.5$, $z/h \leq 1.0$)

VERTICAL FORCE (E_v) = $0.40 W_p$

- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.
- STRUCTURAL ENGINEER OF RECORD SHALL DESIGN THE STRUT(S) AND ITS ATTACHMENTS TO RESIST A LOAD NOT LESS THAN $V_{u\text{STRUT}}$ IN COMBINATION WITH ALL OTHER LOADS THAT MAY BE PRESENT, WHERE $V_{u\text{STRUT}} = 0.6V_{u\text{MAX}} \times$ (NO. OF ANCHORS ENGAGED BY STRUT) (MIN)
- AT CONDITIONS WHERE NUT CANNOT BE PROVIDED AT TOP SIDE OF STRUT, PROVIDE TAPPED HOLE THROUGH STRUT FLANGE.



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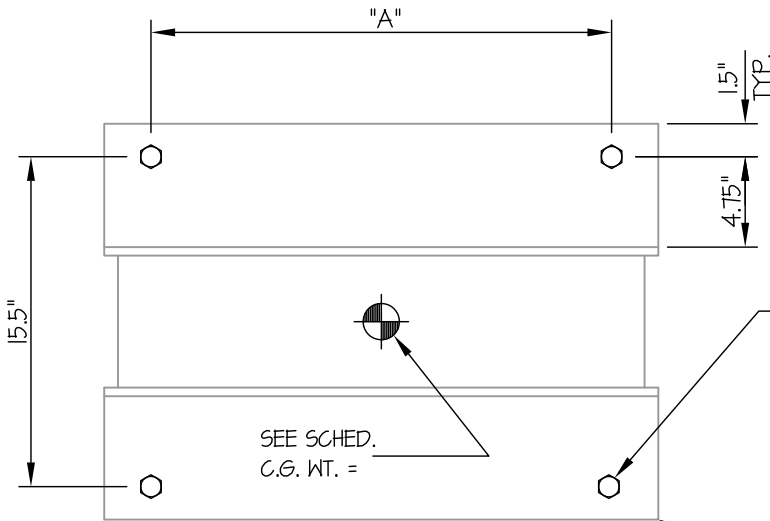
SHEET

4

OF **4** SHEETS

SEISMIC ANCHORAGE

CONCRETE SLAB ON METAL DECK



PLAN VIEW

USE 4- 1/2"φ (A36) THREADED RODS THRU FLOOR (HOLES TO BE 1/16" LARGER THAN BOLT DIAMETER MAX.) TO STRUT BENEATH FLOOR (BY STRUCTURAL ENGINEER OF RECORD)

RACK BASE ANGLE ASSY. 1/8" THK. (A36) (MIN.) (BY CHATSWORTH PRODUCTS)

MODEL NO.	"A"	WEIGHT (lbs)	T _U (lb/bolt)	V _U (lb/bolt)
* 66353-X03	16"	173	4663	156
66363-X03	32"	175	4200	158

* MODEL REPRESENTED IN CALCULATION BELOW

LOADS: PER 2010 CALIFORNIA BUILDING CODE AND ASCE 7-05

(STRENGTH DESIGN IS USED) (S_{bs} = 200, a_p = 2.5, l_p = 1.5, R_p = 2.5, z/h ≤ 10)

WEIGHT = 173 LB

HORIZONTAL FORCE (E_h) = 3.60W_p = 622 LB

VERTICAL FORCE (E_v) = 0.40W_p = 69 LB

BOLT FORCES:

TENSION (T)

$$T_{U \text{ MAXIMUM}} = \left[\frac{622\#(44\#)}{2\text{BOLTS}(16\#)} \times (0.3) \right] + \frac{622\#(44\#)}{2\text{BOLTS}(15.5\#)} - \frac{173\#(0.9) - 69\#}{4\text{BOLTS}} = 1119 \text{ LB/BOLT (MAX)}$$

(HORIZ - SIDE TO SIDE) (HORIZ - FRONT TO BACK) (WEIGHT (0.9) - E_v)

SHEAR (V)

$$V_{U \text{ MAXIMUM}} = \frac{622\#}{4\text{BOLTS}} = 156 \text{ LB/BOLT (MAX) (PER AISC J3.7, LESS THAN 20% STRESS)}$$

PRYING

$$M_{\text{PRYING}} = 1119\#(4.75\#) = 5315\#\text{'}$$

$$T_{\text{PRYING}} = 5315\#\#/1.5\# = 3544\#\text{'}$$

$$T_{\text{MAX}} = 3544\#\# + 1114\# = \underline{4663 \text{ LB/BOLT (MAX)}}$$

BOLT SPECS : 1/2"φ (A36) THREADED ROD

φT = 6610 LB/BOLT

φV = 3530 LB/BOLT