

CHATSWORTH PRODUCTS, INC.

UNIVERSAL RACK

DES. J. ROBERSON

JOB NO. 11-1131

DATE 6/19/12

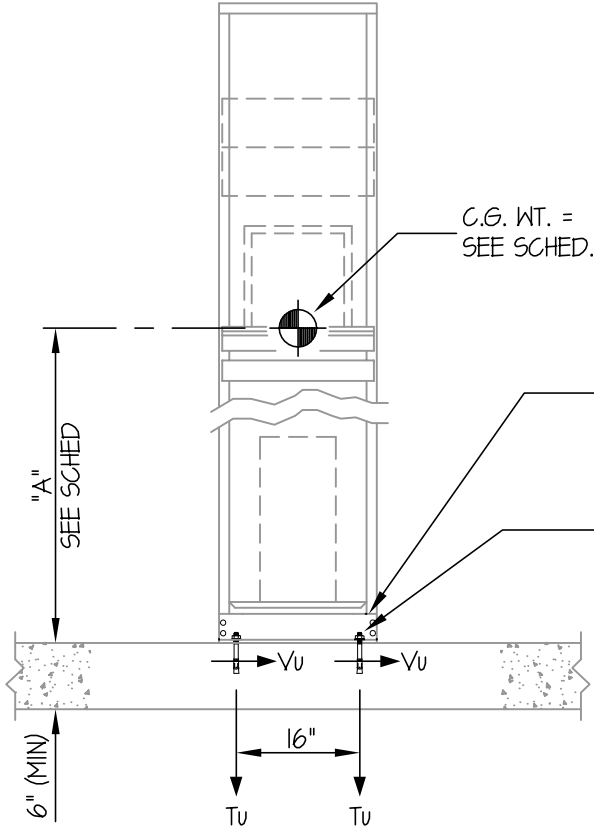
SHEET

1

OF **2** SHEETS

SEISMIC ANCHORAGE

CONCRETE SLAB

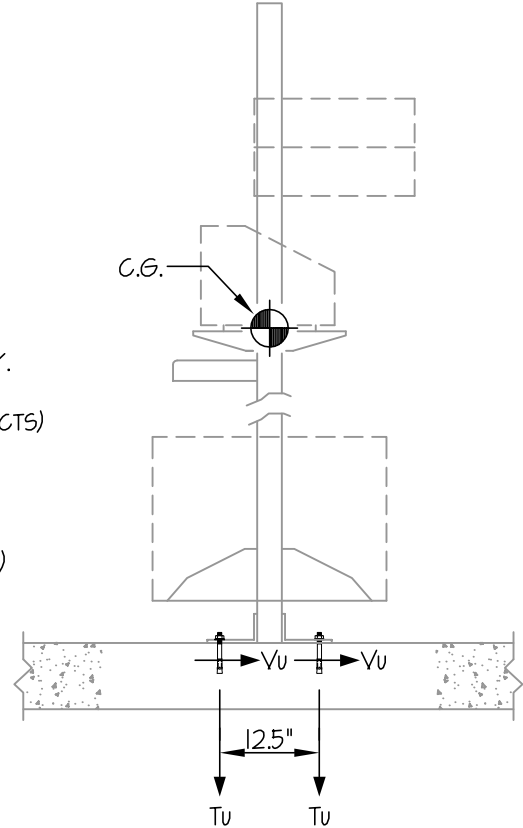


FRONT ELEVATION

C.G. WT. =
SEE SCHED.

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")



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.



CHATSWORTH PRODUCTS, INC.

UNIVERSAL RACK

DES. J. ROBERSON

JOB NO. 11-1131

DATE 6/19/12

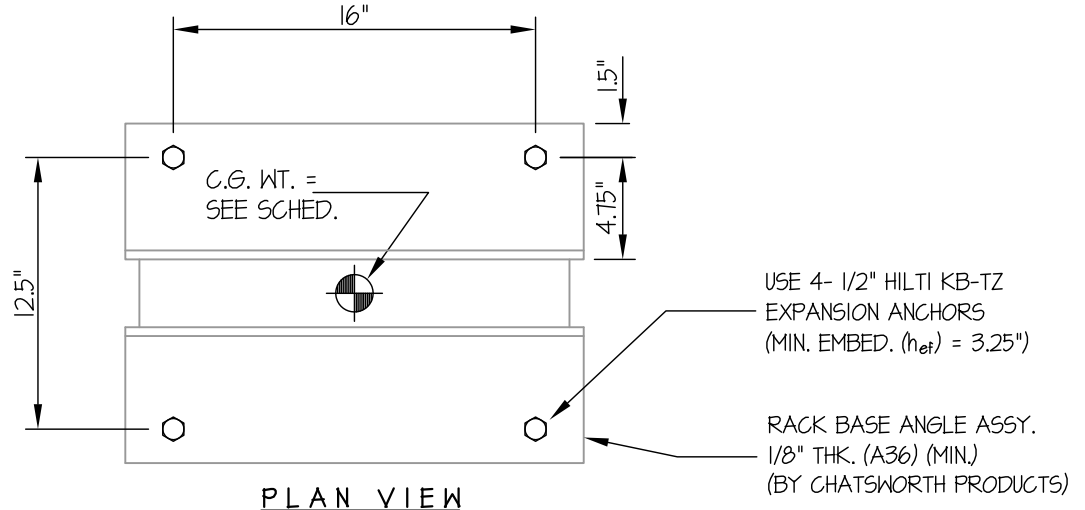
SHEET

2

OF **2** SHEETS

SEISMIC ANCHORAGE

CONCRETE SLAB



PLAN VIEW

MODEL NO.	"A"	WEIGHT (lbs)	T _U (lb/bolt)	V _U (lb/bolt)
* 46353-X03	44"	164	1709	99
46353-X05	47"	144	1604	86
46353-X15	50"	124	1475	75

* 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, I_p = 1.5, R_p = 2.5, z/h = 0.0)

WEIGHT = 164 LB

HORIZONTAL FORCE (E_h) = 120W_p = 197 LB

VERTICAL FORCE (E_v) = 0.40W_p = 66 LB

BOLT FORCES:

TENSION (T)

$$T_{U \text{ MAXIMUM}} = \left[\frac{197\#(44")}{2\text{BOLTS}(16")} \times (0.3) \right] + \frac{197\#(44")}{2\text{BOLTS}(12.5")} - \frac{164\#(0.9) - 66\#}{4\text{BOLTS}} = 410 \text{ LB/BOLT (MAX)}$$

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

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

$$V_{U \text{ MAXIMUM}} = \frac{197\#}{2 \text{ BOLTS}} = 99 \text{ LB/BOLT (MAX)}$$

PRYING

$$M_{\text{PRYING}} = 410\#(4.75") = 1948"\#$$

$$T_{\text{PRYING}} = 1948"\#/1.5" = 1299"\#$$

$$T_{\text{MAX}} = 1299"\# + 410\# = \underline{1709 \text{ LB/BOLT (MAX)}}$$

UNITY CHECK:

$$\left(\frac{T_U}{\phi T} \right) + \left(\frac{V_U}{\phi V} \right) \leq 1.2 \quad \left(\frac{1709}{2396} \right) + \left(\frac{99}{3232} \right) = .74 \leq 1.2 \quad \therefore \text{O.K.}$$

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

ϕT=0.75ϕNn = 2396 LB/BOLT (TENSION)

ϕV=0.75ϕVn = 3232 LB/BOLT (SHEAR)

CHATSWORTH PRODUCTS, INC.

UNIVERSAL RACK

DES. **J. ROBERSON**

JOB NO. **11-1131**

DATE **6/19/12**

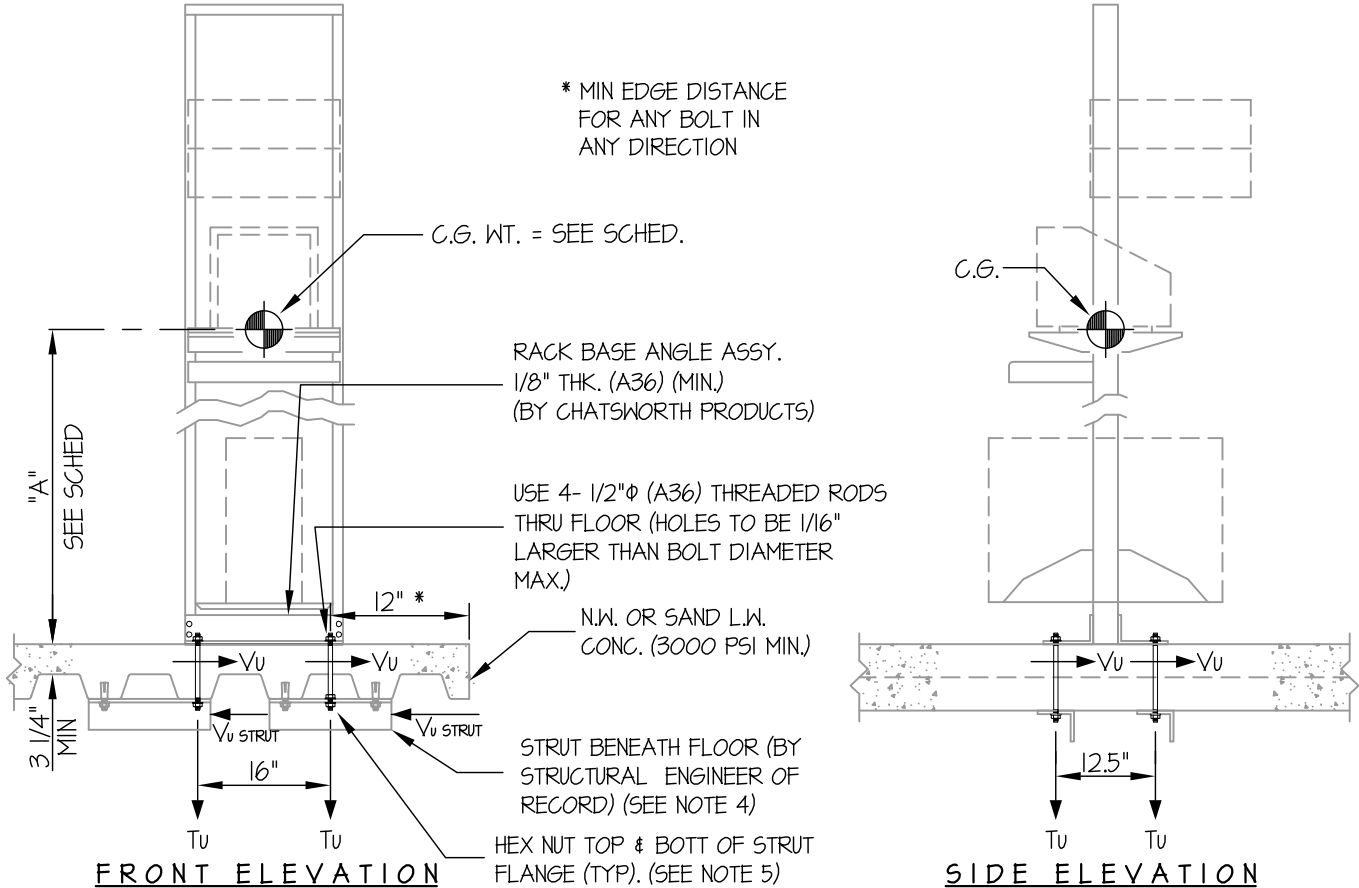
SHEET

1

OF **2** 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) = $3.60 W_p$ ($S_{Ds} = 2.0, a_p = 2.5, I_p = 1.5, R_p = 2.5, z/h \leq 1.0$)
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 $V_{U \text{ STRUT}} = 0.6 V_{U \text{ MAX}} \times (\text{NO. OF ANCHORS ENGAGED BY STRUT}) (\text{MIN})$
- AT CONDITIONS WHERE NUT CANNOT BE PROVIDED AT TOP SIDE OF STRUT, PROVIDE TAPPED HOLE THROUGH STRUT FLANGE.



CHATSWORTH PRODUCTS, INC.

UNIVERSAL RACK

DES. J. ROBERSON

JOB NO. 11-1131

DATE 6/19/12

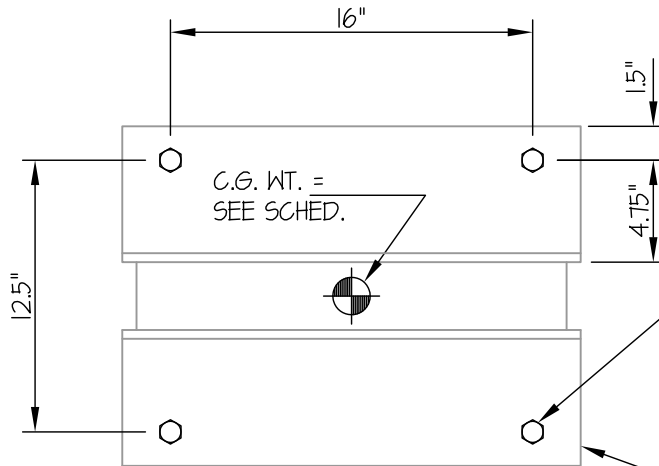
SHEET

2

OF **2** SHEETS

SEISMIC ANCHORAGE

CONCRETE SLAB ON METAL DECK



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)

PLAN VIEW

MODEL NO.	"A"	WEIGHT (lbs)	T _U (lb/bolt)	V _U (lb/bolt)
* 46353-X03	44"	164	5259	148
46353-X05	47"	144	4938	130
46353-X15	50"	124	4529	112

* 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, I_p = 15, R_p = 2.5, z/h ≤ 1.0)

WEIGHT = 164 LB

HORIZONTAL FORCE (E_h) = 3.60W_p = 590 LB

VERTICAL FORCE (E_v) = 0.40W_p = 66 LB

BOLT FORCES:

BOLT SPECS : 1/2"φ (A36) THREADED ROD

φ_T = 6610 LB/BOLT

φ_V = 3525 LB/BOLT

TENSION (T)

$$T_{U \text{ MAXIMUM}} = \left[\frac{590\#(44")}{2\text{BOLTS}(16")} \times (0.3) \right] + \frac{590\#(44")}{2\text{BOLTS}(12.5")} - \frac{164\#(0.9) - 66\#}{4\text{BOLTS}} = 1262 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_{U \text{ MAXIMUM}} = \frac{590\#}{4\text{BOLTS}} = 148 \text{ LB/BOLT (MAX) (PER AISC J3.7, LESS THAN 20% STRESS)}$$

PRYING

$$M_{\text{PRYING}} = 1262\#(4.75") = 5995"\#$$

$$T_{\text{PRYING}} = 5995"\#/1.5" = 3997"\#$$

$$T_{\text{MAX}} = 3997"\# + 1262\# = \underline{\underline{5259 \text{ LB/BOLT (MAX)}}$$