

CHATSWORTH PRODUCTS, INC.

UNIVERSAL RACK WITH GUSSET

DES. J. ROBERSON

JOB NO. 11-1131

DATE 6/19/12

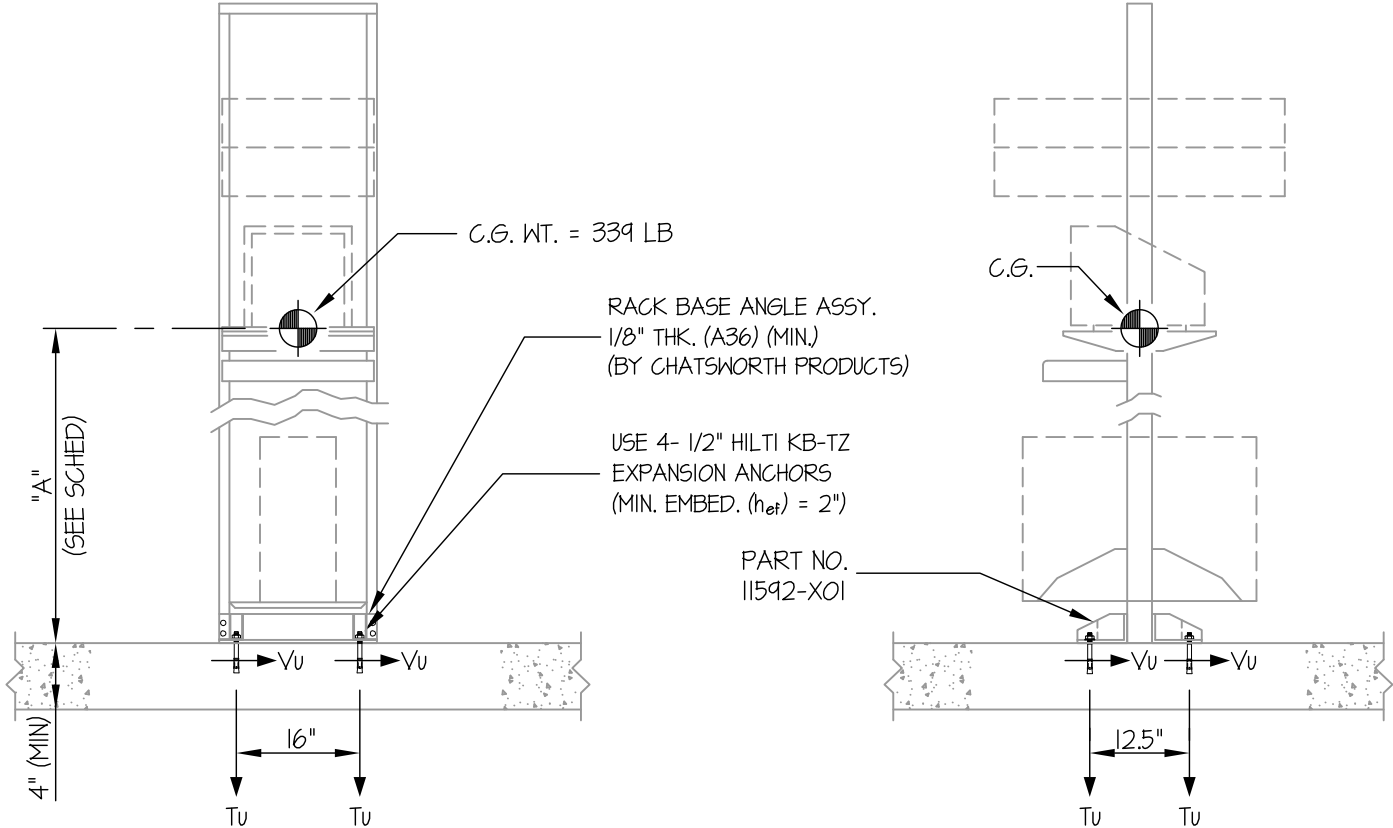
SHEET

1

OF **2** SHEETS

SEISMIC ANCHORAGE

CONCRETE SLAB



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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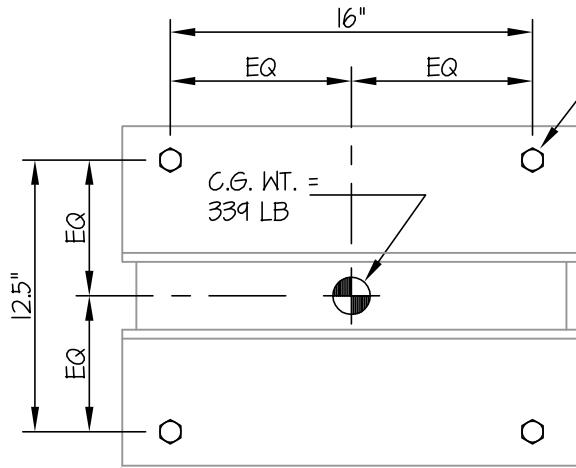
SHEET

2

OF **2** SHEETS

SEISMIC ANCHORAGE

CONCRETE SLAB



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

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"	339	847	102
46353-X05	47"	157	420	47
46353-X15	50"	129	368	39

* 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 = 339 LB

HORIZONTAL FORCE (E_h) = 120W_p = 407 LB

VERTICAL FORCE (E_v) = 0.40W_p = 136 LB

BOLT FORCES:

TENSION (T)

$$T_U \text{ MAXIMUM} = \left[\frac{407\#(44")}{2\text{BOLTS}(16")} \times (0.3) \right] + \frac{407\#(44")}{2\text{BOLTS}(12.5")} - \frac{339\#(0.9) - 136\#}{4\text{BOLTS}} = 847 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_U \text{ MAXIMUM} = \frac{407\#}{4 \text{ BOLTS}} = 102 \text{ LB/BOLT (MAX)}$$

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

φT=0.75φN_t = 1172 LB/BOLT (TENSION)

φV=0.75φV_n = 1262 LB/BOLT (SHEAR)

UNITY CHECK:

$$\left(\frac{T_U}{\phi T} \right) + \left(\frac{V_U}{\phi V} \right) \leq 1.2 \quad \left(\frac{847}{1172} \right) + \left(\frac{102}{1262} \right) = 0.80 \leq 1.2 \therefore \text{O.K.}$$

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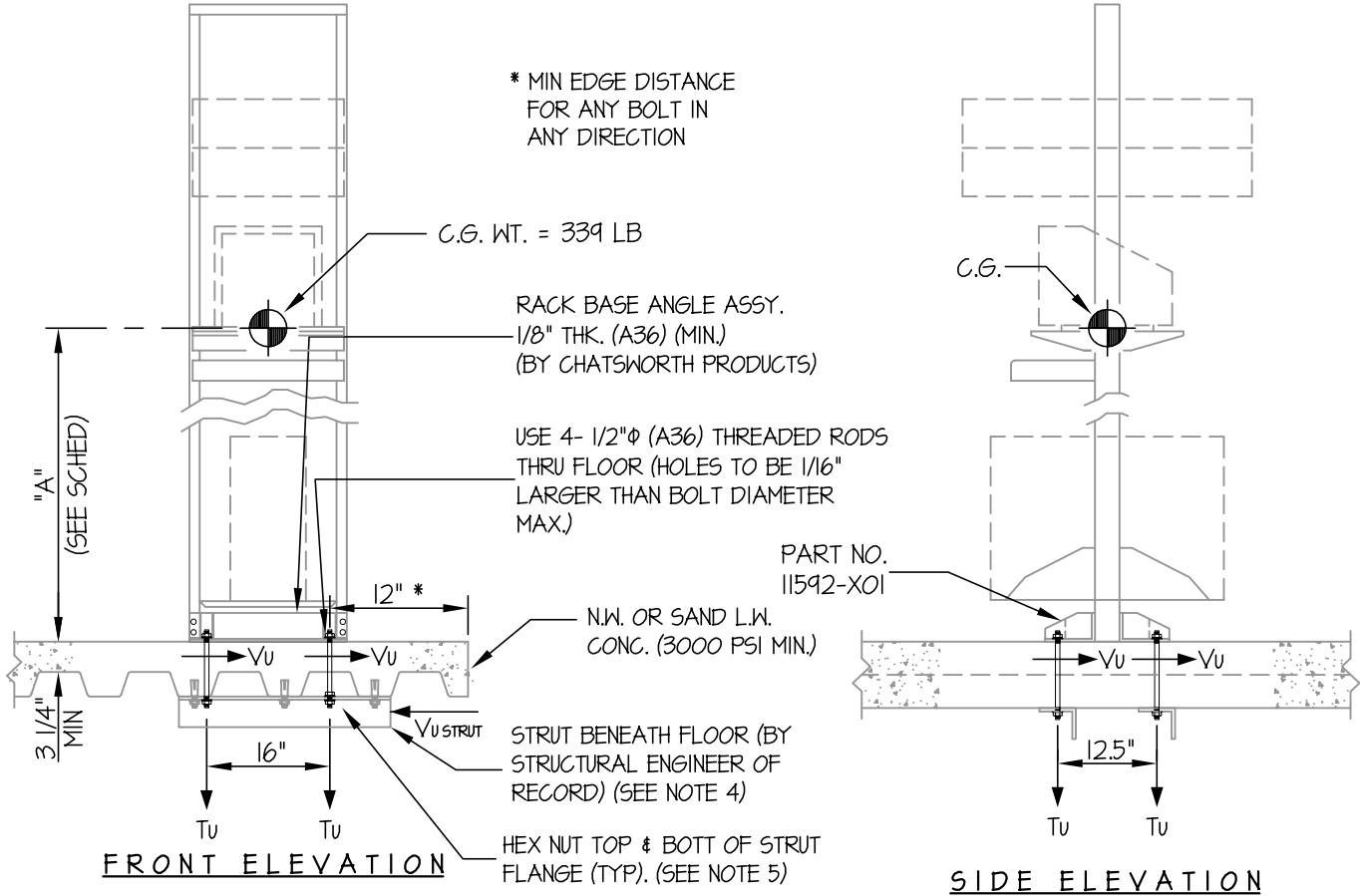
SHEET

1

OF **2** SHEETS

SEISMIC ANCHORAGE

CONCRETE SLAB ON METAL DECK



NOTES:

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

HORIZONTAL FORCE (E_h) = $3.60 W_p$ ($S_d_s = 2.00$, $a_p = 2.5$, $I_p = 1.5$, $R_p = 2.5$, $z/h \leq 1.0$)

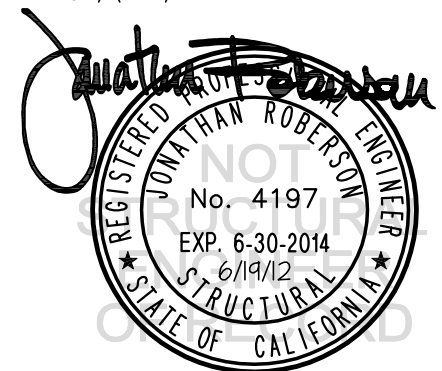
VERTICAL FORCE (E_v) = $0.40 W_p$

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 STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.

4. 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)

5. AT CONDITIONS WHERE NUT CANNOT BE PROVIDED AT TOP SIDE OF STRUT, PROVIDE TAPPED HOLE THROUGH STRUT FLANGE.



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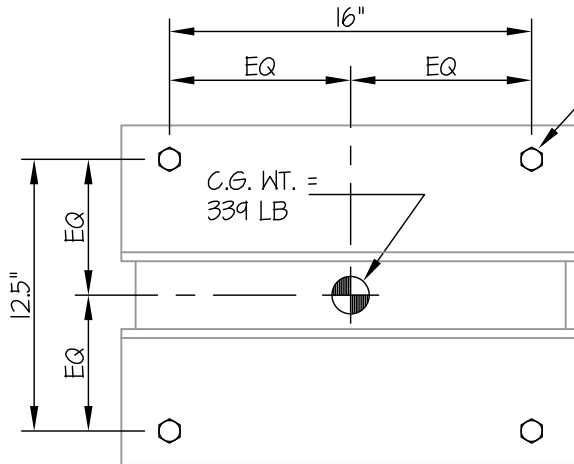
SHEET

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 OR OTHER SUPPORTING MEMBER (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"	339	2625	305
46353-X05	47"	157	1300	141
46353-X15	50"	129	1137	116

* 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 ≤ 1.0)

WEIGHT = 339 LB

HORIZONTAL FORCE (E_h) = 3.60W_p = 1220 LB

VERTICAL FORCE (E_v) = 0.40W_p = 136 LB

BOLT FORCES:

BOLT SPECS: 1/2"φ (A36) THREADED RODS:

φ_T = 6610 LB/BOLT

φ_V = 3530 LB/BOLT

TENSION (T)

$$T_U \text{ MAXIMUM} = \left[\frac{1220\#(44")}{2\text{BOLTS}(16")} \times (0.3) \right] + \frac{1220\#(44")}{2\text{BOLTS}(12.5")} - \frac{339\#(0.9) - 136\#}{4\text{BOLTS}} = 2625 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_U \text{ MAXIMUM} = \frac{1220\#}{4\text{BOLTS}} = 305 \text{ LB/BOLT (MAX) (PER AISC J3.7, LESS THAN 20% STRESS)}$$