

PATTERSON-KELLEY CO.

P-K MACH 'n' ROLL MnR300/399/500

DES. **J. ROBERSON**

JOB NO. **11-1535**

DATE **12/7/15**

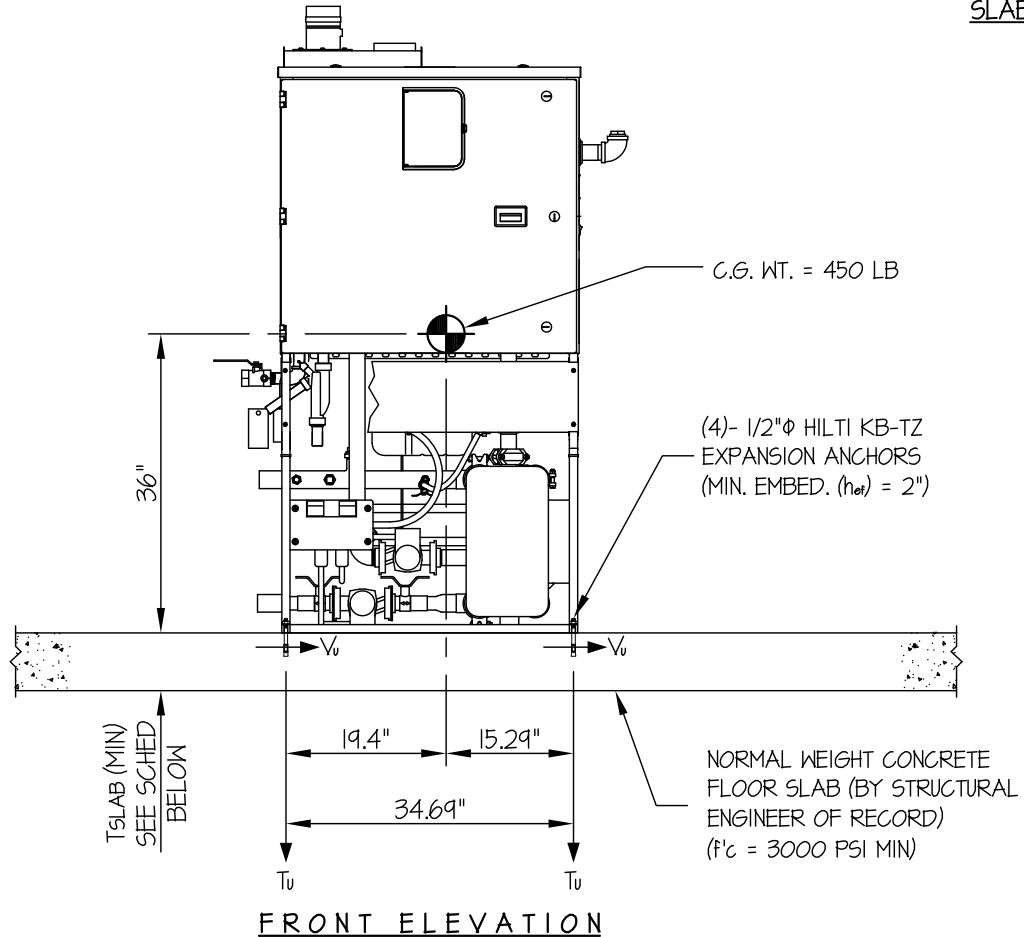
SHEET

1

OF **3** SHEETS

SEISMIC ANCHORAGE

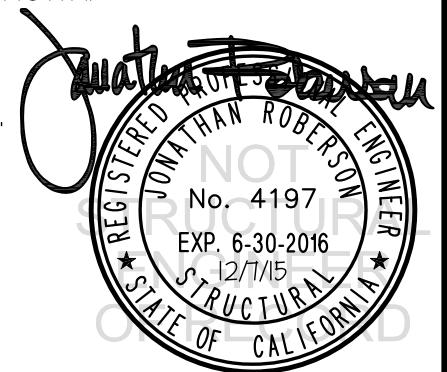
SLAB ON GRADE



ANCHORS							
MAX Sds	TYPE	DIAM	EFF EMBED	QTY	TSLAB	Tu (lb)	Vu (lb)
115	HILTI KB-TZ	1/2"	2"	4	4"	1151	212
220	HILTI HIT-HY	1/2"	3.25"	4	6"	2361	407

NOTES:

- FORCES ARE DETERMINED PER 2013 CALIFORNIA BUILDING CODE AND ASCE 7-10**
STRENGTH DESIGN IS USED. ($\alpha_p = 1.0$, $l_p = 1.5$, $R_p = 2.5$, $\Omega_o = 2.5$, $z/h = 0$)
- CENTER OF GRAVITY (C.G.) AND WEIGHT ARE THE GOVERNING PARAMETERS FOR DESIGN. THESE CALCULATIONS ENCOMPASS ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- 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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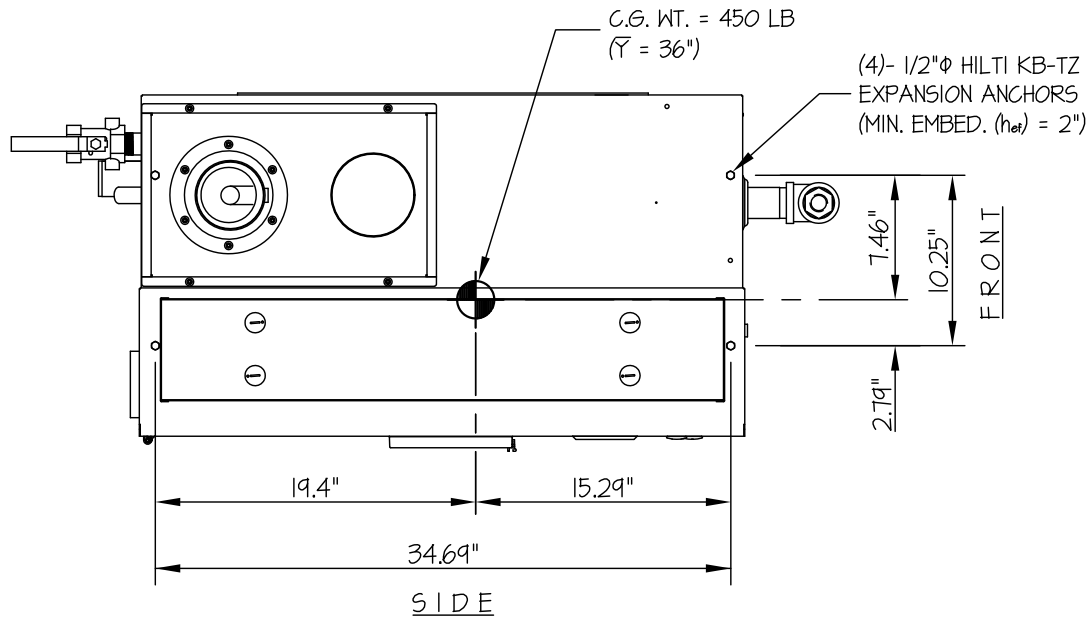
2

OF **3** SHEETS

SEISMIC ANCHORAGE

MAX $S_{Ds} \leq 1.15$

SLAB ON GRADE



PLAN AT BASE

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

STRENGTH DESIGN IS USED ($S_{Ds} = 1.15$, $\alpha_p = 1.0$, $l_p = 1.5$, $R_p = 2.5$, $\Omega_o = 2.5$, $z/h = 0$)

WEIGHT = 450 LB

HORIZONTAL FORCE (E_{mh}) = 129 $W_p = 581$ LB

VERTICAL FORCE (E_v) = 0.23 $W_p = 104$ LB

BOLT FORCES:

BOLT SPEC: 1/2" ϕ HILTI KB-TZ:

$\phi T = 0.75 \phi N_n = 1284$ LB/BOLT (TENSION)

$\phi V = \phi V_n = 1844$ LB/BOLT (SHEAR)

TENSION (T)

$$T_{u \text{ MAXIMUM}} = \left[\frac{581\#(36'')(7.46'')}{1 \text{ BOLT } (34.69'')(10.25'')} \times (0.3) \right] + \frac{581\#(36'')(19.4'')}{1 \text{ BOLT } (10.25'')(34.69'')} - \frac{(450\#(0.9) - 104\#)(19.4'')(7.46'')}{1 \text{ BOLT } (34.69'')(10.25'')} = 1151 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_{u \text{ MAXIMUM}} = \frac{581\#(7.46'')}{2 \text{ BOLTS } (10.25'')} = 212 \text{ LB/BOLT (MAX)}$$

UNITY CHECK:

$$\left(\frac{T_u}{\phi T} \right) + \left(\frac{V_u}{\phi V} \right) \leq 1.2 \quad \left(\frac{1151}{1284} \right) + \left(\frac{212}{1844} \right) = 1.01 \leq 1.2 \quad \therefore \text{OK}$$

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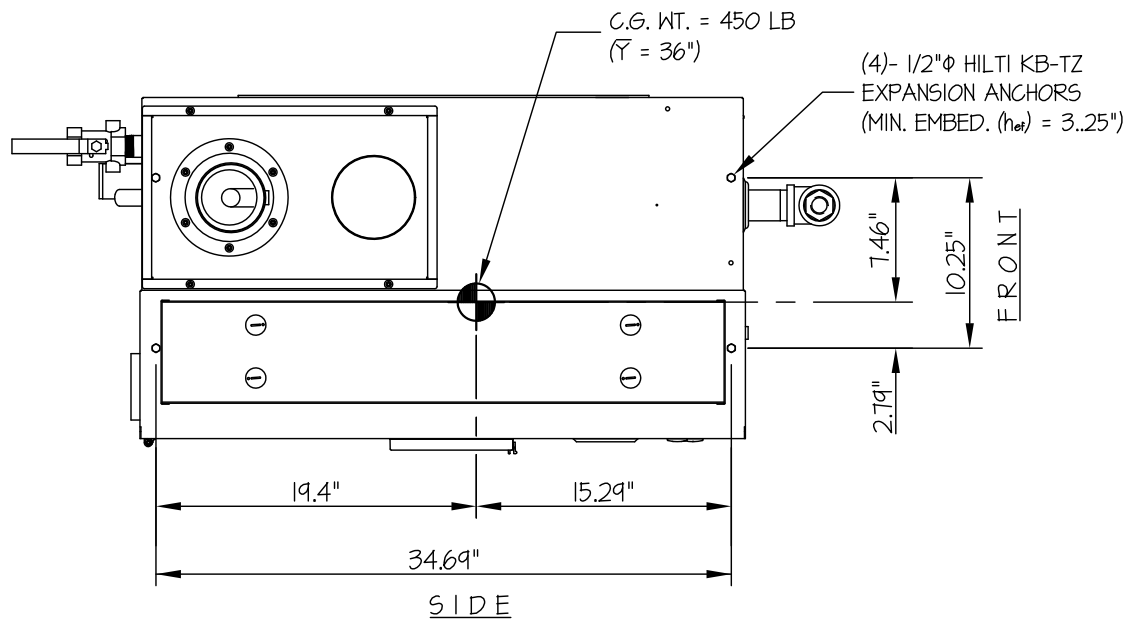
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OF **3** SHEETS

SEISMIC ANCHORAGE

1.15 < MAX S_{DS} ≤ 2.20

SLAB ON GRADE



PLAN AT BASE

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

STRENGTH DESIGN IS USED (S_{DS} = 2.20, a_p = 10, l_p = 15, R_p = 2.5, Ω_o = 2.5, z/h = 0)

WEIGHT = 450 LB

HORIZONTAL FORCE (E_{mh}) = 2.48 W_p = 1116 LB

VERTICAL FORCE (E_v) = 0.44 W_p = 198 LB

BOLT FORCES:

BOLT SPEC: 1/2"φ HILTI KB-TZ:

φT = 0.75 φN_t = 2625 LB/BOLT (TENSION)

φV = φV_n = 3572 LB/BOLT (SHEAR)

TENSION (T)

$$T_u \text{ MAXIMUM} = \left[\frac{1116\#(36'')(7.46'')}{1 \text{ BOLT } (34.69'')(10.25'')} \times (0.3) \right] + \frac{1116\#(36'')(19.4'')}{1 \text{ BOLT } (10.25'')(34.69'')} - \frac{(450\#(0.9) - 198\#)(19.4'')(7.46'')}{1 \text{ BOLT } (34.69'')(10.25'')} = 2361 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_u \text{ MAXIMUM} = \frac{1116\#(7.46'')}{2 \text{ BOLTS } (10.25'')} = 407 \text{ LB/BOLT (MAX)}$$

UNITY CHECK:

$$\left(\frac{T_u}{\phi T} \right) + \left(\frac{V_u}{\phi V} \right) \leq 1.2 \quad \left(\frac{2361}{2625} \right) + \left(\frac{407}{3572} \right) = 1.01 \leq 1.2 \quad \therefore \text{OK.}$$

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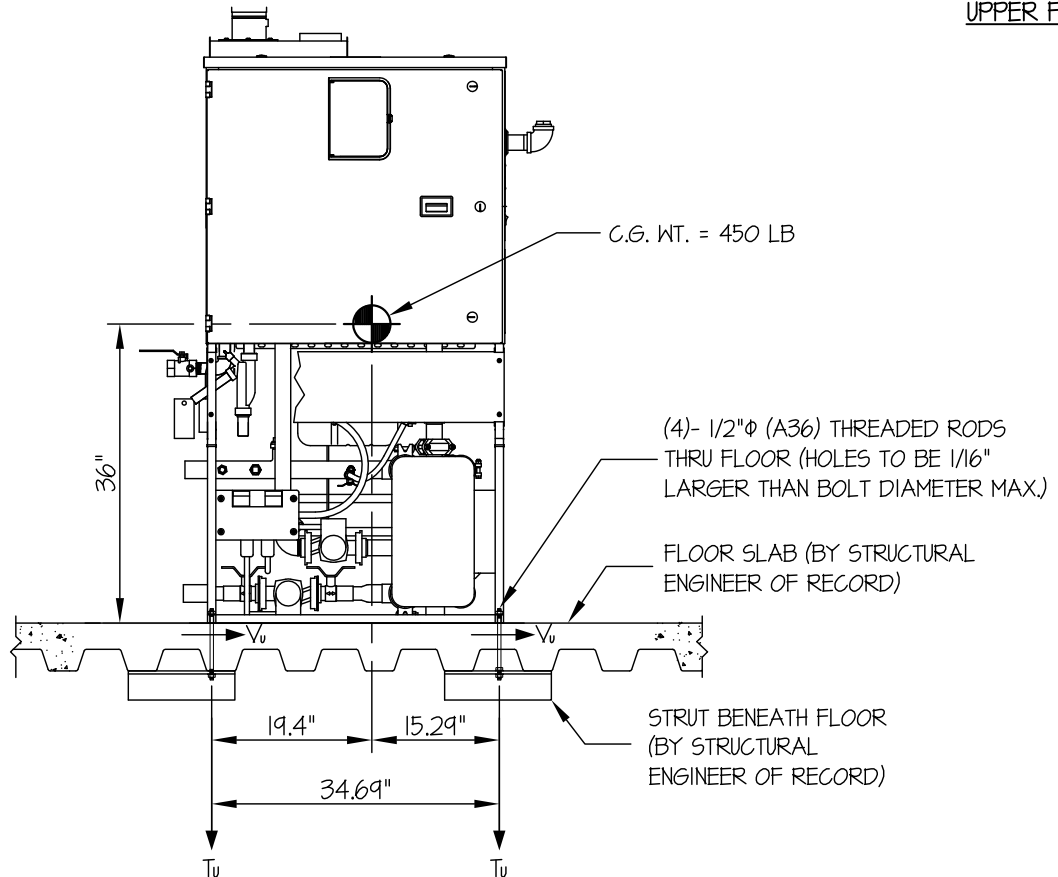
SHEET

1

OF **2** SHEETS

SEISMIC ANCHORAGE

UPPER FLOOR



$T_u = 1474 \text{ LB/BOLT (MAX)}$
 $V_u = 259 \text{ LB/BOLT (MAX)}$

FRONT ELEVATION

NOTES:

- FORCES ARE DETERMINED PER 2013 CALIFORNIA BUILDING CODE AND ASCE 7-10.**
STRENGTH DESIGN IS USED. ($S_{ds} = 2.20$, $\alpha_p = 1.0$, $I_p = 1.5$, $R_p = 2.5$, $z/h \leq 1$)
HORIZONTAL FORCE (E_h) = $1.58 W_p$
VERTICAL FORCE (E_v) = $0.44 W_p$
- CENTER OF GRAVITY (C.G.) AND WEIGHT ARE THE GOVERNING PARAMETERS FOR DESIGN. THESE CALCULATIONS ENCOMPASS ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- 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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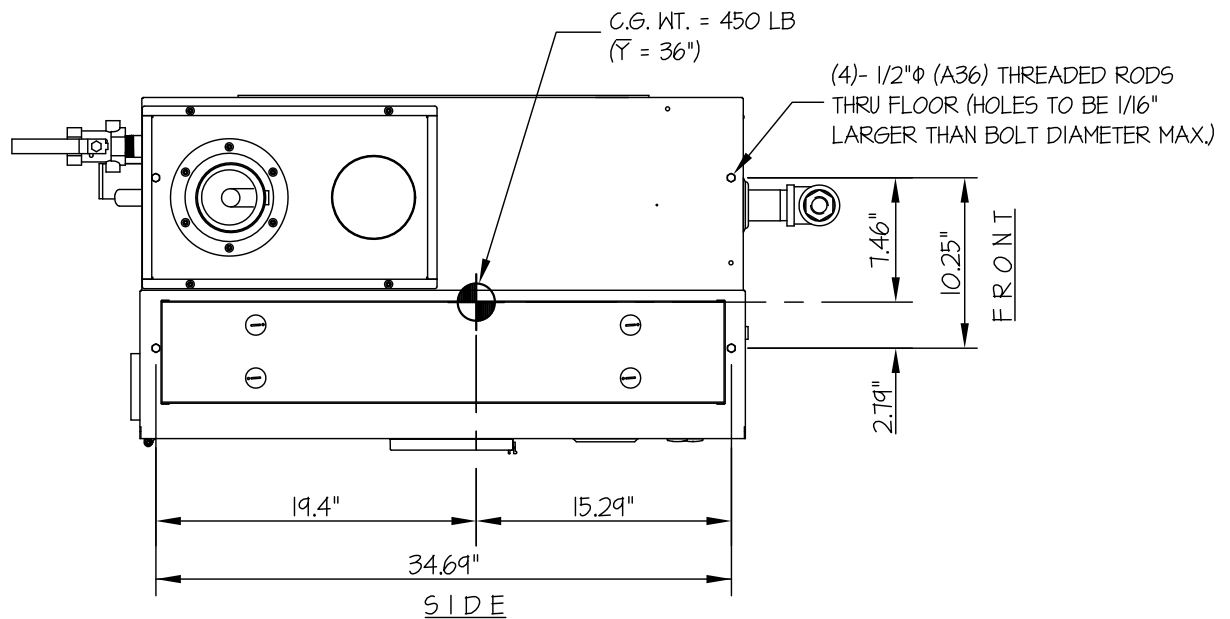
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OF **2** SHEETS

SEISMIC ANCHORAGE

UPPER FLOOR



PLAN AT BASE

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

STRENGTH DESIGN IS USED ($S_Ds = 2.20$, $a_p = 1.0$, $I_p = 1.5$, $R_p = 2.5$, $z/h \leq 1$)

WEIGHT = 450 LB

HORIZONTAL FORCE (E_h) = $1.58W_p = 711$ LB

VERTICAL FORCE (E_v) = $0.44W_p = 198$ LB

BOLT FORCES:

BOLT SPECS: 1/2" ϕ (A36) THREADED ROD

$\phi T = 6395$ LB/BOLT (TENSION)

$\phi V = 3410$ LB/BOLT (SHEAR)

TENSION (T)

$$T_{U \text{ MAXIMUM}} = \left[\frac{711\#(36\")(7.46\"){}}{1 \text{ BOLT } (34.69\")(10.25\")} \times (0.3) \right] + \frac{711\#(36\")(19.4\"){}}{1 \text{ BOLT } (10.25\")(34.69\")} - \frac{(450\#(0.9) - 198\#(19.4\")(7.46\"){}}{1 \text{ BOLT } (34.69\")(10.25\")} = 1474 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_{U \text{ MAXIMUM}} = \frac{711\#(7.46\"){}}{2 \text{ BOLTS } (10.25\")} = 259 \text{ LB/BOLT (MAX)}$$