

PATTERSON-KELLEY CO.

DES. **J. ROBERSON**

SHEET

1

JOB NO. **11-1701**

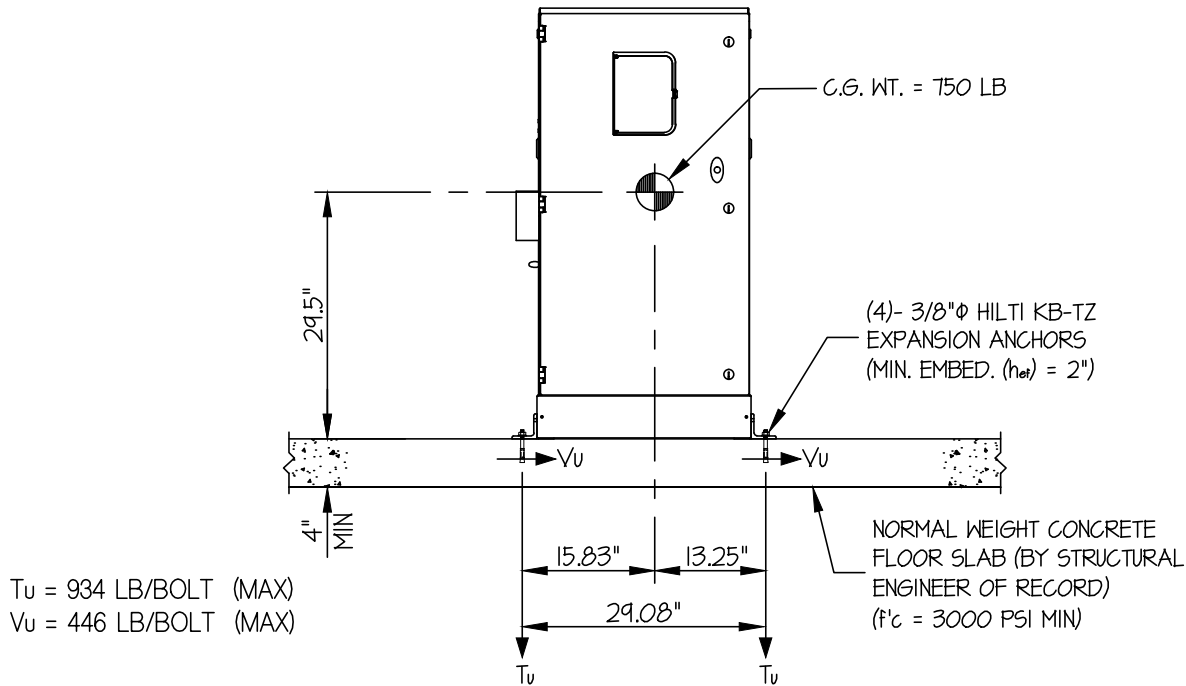
DATE **2/23/17**

OF **2** SHEETS

SC(D)650/SC(D)750/SC(D)850/SC(D)1000 NURO SONIC BOILER

SEISMIC ANCHORAGE

SLAB ON GRADE



FRONT ELEVATION

NOTES:

- FORCES ARE DETERMINED PER 2016 CALIFORNIA BUILDING CODE AND ASCE 7-10 STRENGTH DESIGN IS USED. ($S_{DS} = 2.20$, $\alpha_p = 1.0$, $I_p = 1.5$, $R_p = 2.5$, $\Omega_0 = 2.0$, $z/h = 0$)

HORIZONTAL FORCE (E_h) = 0.99 W_p

HORIZONTAL FORCE (E_{mh}) = 1.98 W_p (FOR CONCRETE ANCHORAGE)

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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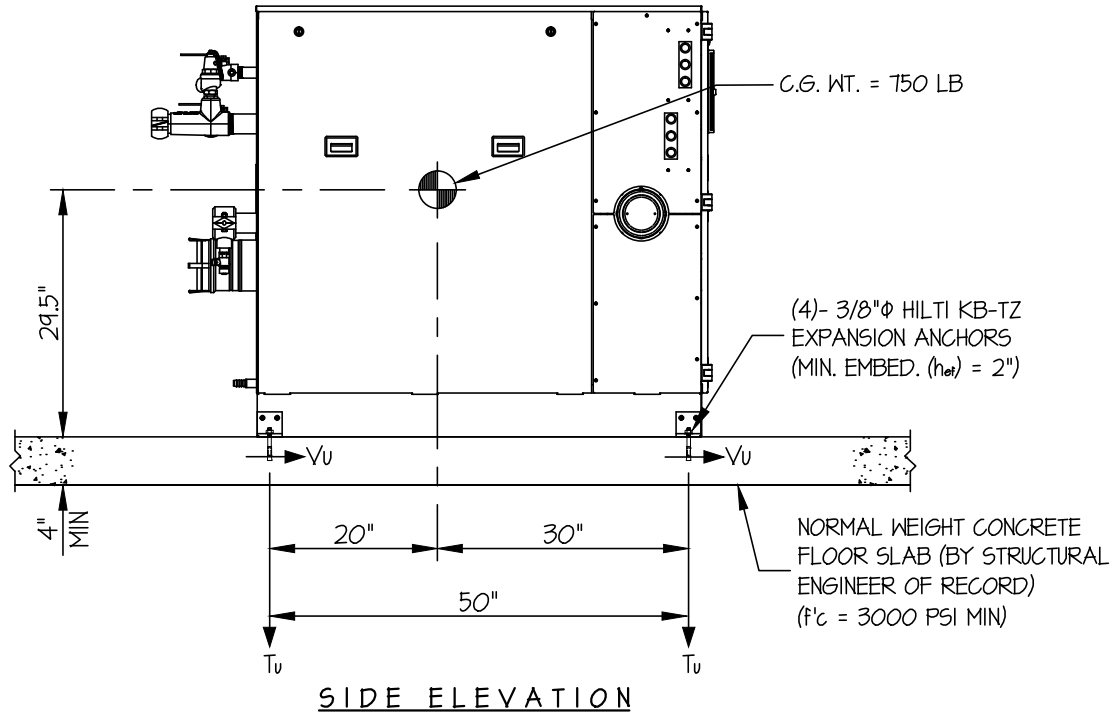
SHEET

2

OF 2 SHEETS

SEISMIC ANCHORAGE

SLAB ON GRADE



LOADS: PER 2016 CALIFORNIA BUILDING CODE AND ASCE 7-10.

STRENGTH DESIGN IS USED ($S_{Ds} = 2.20$, $a_p = 1.0$, $I_p = 1.5$, $R_p = 2.5$, $\Omega_o = 2.0$, $z/h = 0$)

WEIGHT = 750 LB

HORIZONTAL FORCE (E_{mh}) = $1.98 W_p = 1485$ LB

VERTICAL FORCE (E_v) = $0.44 W_p = 330$ LB

BOLT FORCES:

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

$\phi T = 0.75 \phi N_h = 1212$ LB/BOLT (TENSION)

$\phi V = \phi V_h = 1466$ LB/BOLT (SHEAR)

TENSION (T)

$$T_{u \text{ MAXIMUM}} = \left[\frac{1485\#(29.5'')(15.83'')}{1 \text{ BOLT } (50'')(29.08'')} \times (0.3) \right] + \frac{1485\#(29.5'')(30'')}{1 \text{ BOLT } (29.08'')(50'')} - \frac{(750\#(0.9) - 330\#)(15.83'')(30'')}{1 \text{ BOLT } (29.08'')(50'')} = 934 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_{u \text{ MAXIMUM}} = \frac{1485\#(30'')}{2 \text{ BOLTS } (50'')} = 446 \text{ LB/BOLT (MAX)}$$

UNITY CHECK:

$$\left(\frac{T_u}{\phi T} \right) + \left(\frac{V_u}{\phi V} \right) \leq 1.2 \quad \left(\frac{934}{1212} \right) + \left(\frac{446}{1466} \right) = 1.07 \leq 1.2 \quad \therefore \text{O.K.}$$

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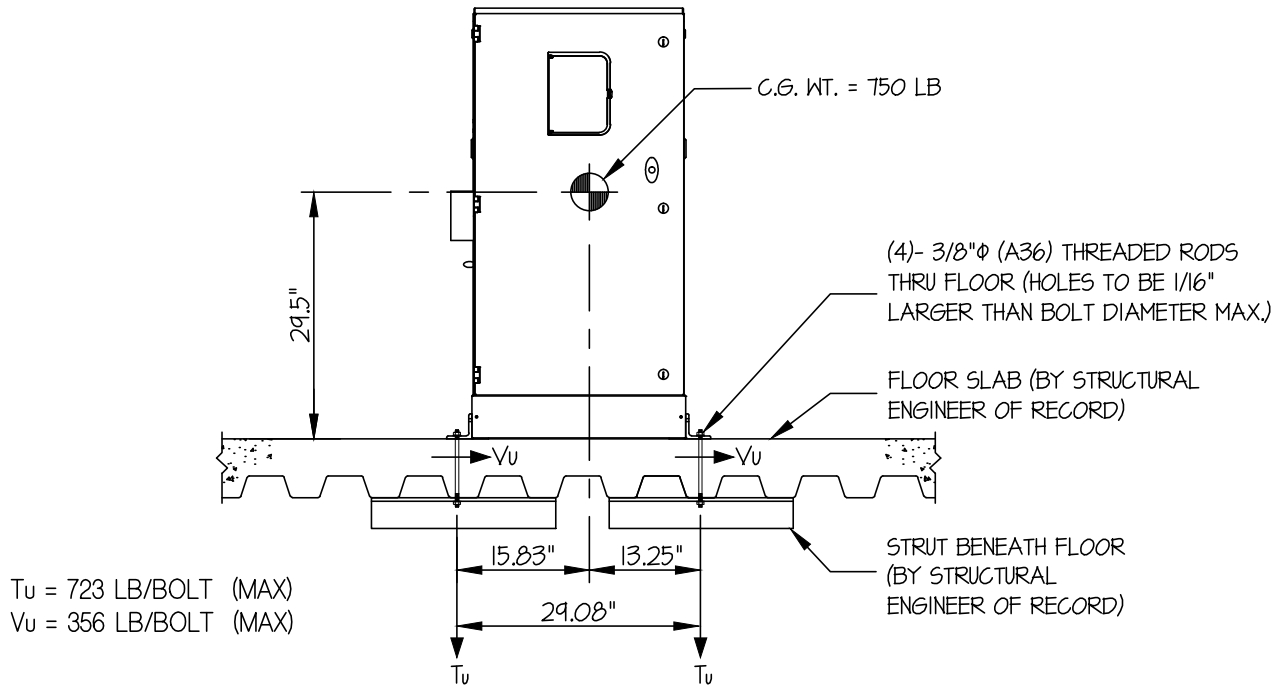
SHEET

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OF **2** SHEETS

SEISMIC ANCHORAGE

UPPER FLOOR



FRONT ELEVATION

NOTES:

1. **FORCES ARE DETERMINED PER 2016 CALIFORNIA BUILDING CODE AND ASCE 7-10.**
STRENGTH DESIGN IS USED. ($S_{bs} = 2.20$, $a_p = 1.0$, $l_p = 1.5$, $R_p = 2.5$, $z/h \leq 1$)

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.

Jonathan Roberson
 REGISTERED PROFESSIONAL ENGINEER
 JONATHAN ROBERSON
 No. 4197
 EXP. 6-30-2018
 2/23/17
 STRUCTURAL
 STATE OF CALIFORNIA

PATTERSON-KELLEY CO.

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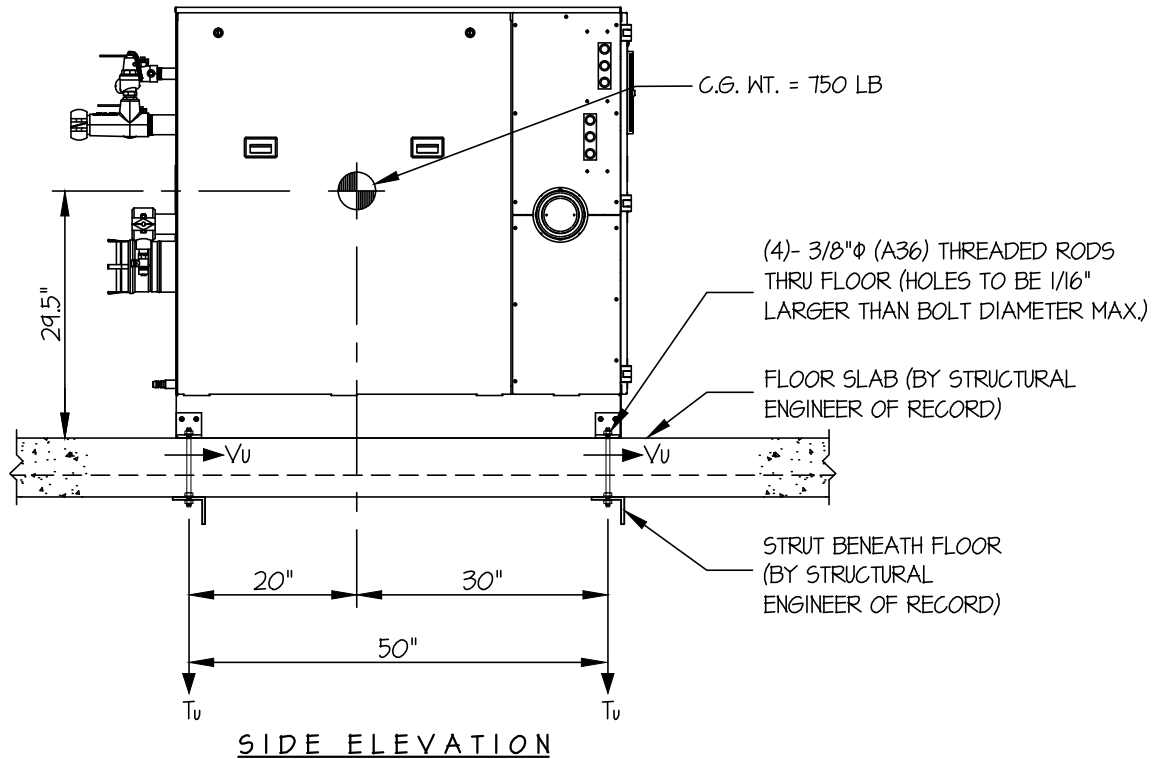
SHEET

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OF 2 SHEETS

SEISMIC ANCHORAGE

UPPER FLOOR



LOADS: PER 2016 CALIFORNIA BUILDING CODE AND ASCE 7-10.

STRENGTH DESIGN IS USED ($S_{ds} = 2.20$, $a_p = 10$, $I_p = 15$, $R_p = 2.5$, $z/h \leq 1$)

WEIGHT = 750 LB

HORIZONTAL FORCE (E_h) = $158 W_p = 1185$ LB

VERTICAL FORCE (E_v) = $0.44 W_p = 330$ LB

BOLT FORCES:

BOLT SPECS: 3/8" ϕ (A36) THREADED ROD

$\phi T = 3589$ LB/BOLT (TENSION)

$\phi V = 1914$ LB/BOLT (SHEAR)

TENSION (T)

$$T_{u \text{ MAXIMUM}} = \left[\frac{1185\#(29.5'')(15.83'')}{1 \text{ BOLT } (50'')(29.08'')} \times (0.3) \right] + \frac{1185\#(29.5'')(30'')}{1 \text{ BOLT } (29.08'')(50'')} - \frac{(750\#(0.9) - 330\#)(15.83'')(30'')}{1 \text{ BOLT } (29.08'')(50'')} = 723 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_{u \text{ MAXIMUM}} = \frac{1185\#(30'')}{2 \text{ BOLTS } (50'')} = 356 \text{ LB/BOLT (MAX)}$$