

### PATTERSON KELLEY

### STORM MODELS 5000 / 6000 / 8000 CONDENSING BOILERS

DES. J. ROBERSON

JOB NO. 11-2330

DATE 11/16/23

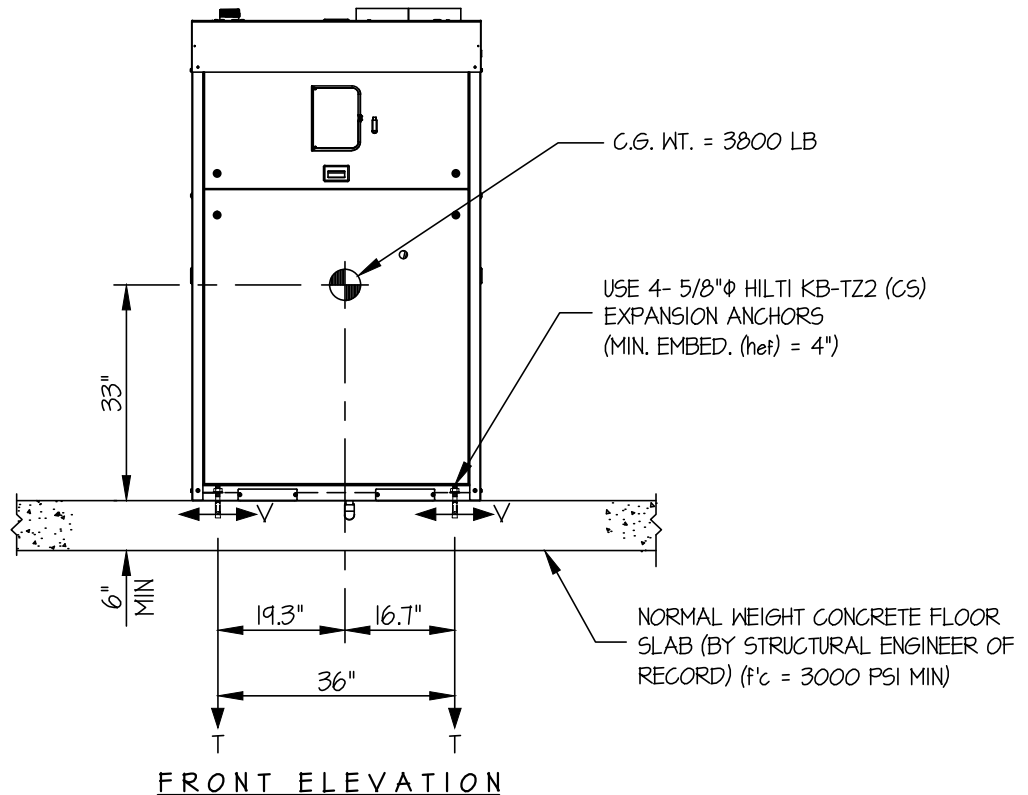
SHEET

1

OF 2 SHEETS

SEISMIC ANCHORAGE

SLAB ON GRADE



$T_u$  = 3077 LB/BOLT (MAX)  
 $V_u$  = 2296 LB/BOLT (MAX)

**NOTES:**

- FORCES ARE DETERMINED PER 2022 CALIFORNIA BUILDING CODE AND ASCE 7-16. STRENGTH DESIGN IS USED. (EXAMPLE:  $S_{ds} = 1.90$ ,  $a_p = 1.0$ ,  $l_p = 1.5$ ,  $R_p = 2.5$ ,  $\Omega_e = 2.0$ ,  $z/h = 0$ )

HORIZONTAL FORCE ( $E_h$ ) =  $0.855 W_p$   
 HORIZONTAL FORCE ( $E_{mh}$ ) =  $1.71 W_p$  (FOR CONCRETE ANCHORAGE)  
 VERTICAL FORCE ( $E_v$ ) =  $0.38 W_p$

- THIS CALCULATION ENCOMPASSES WEIGHTS AND VERTICAL C.G. POSITIONS NOT EXCEEDING VALUES SHOWN.
- THIS CALCULATION WAS PREPARED WITHOUT KNOWLEDGE OF ANY SITE CONDITION. COMPATIBILITY FOR USE WITH A SITE SHALL BE EVALUATED BY THE STRUCTURAL ENGINEER OF RECORD OF THE INSTALLATION (SEOR). USE REQUIRES APPROVAL BY THE SEOR.
- STRUCTURAL ENGINEER OF RECORD FOR THE INSTALLATION SHALL VERIFY ALL CONDITIONS, EVALUATE INTERACTION WITH ADJACENT EQUIPMENT AND ANCHORS, AND PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN IN COMBINATION WITH ALL OTHER LOADS THAT MAY BE PRESENT.



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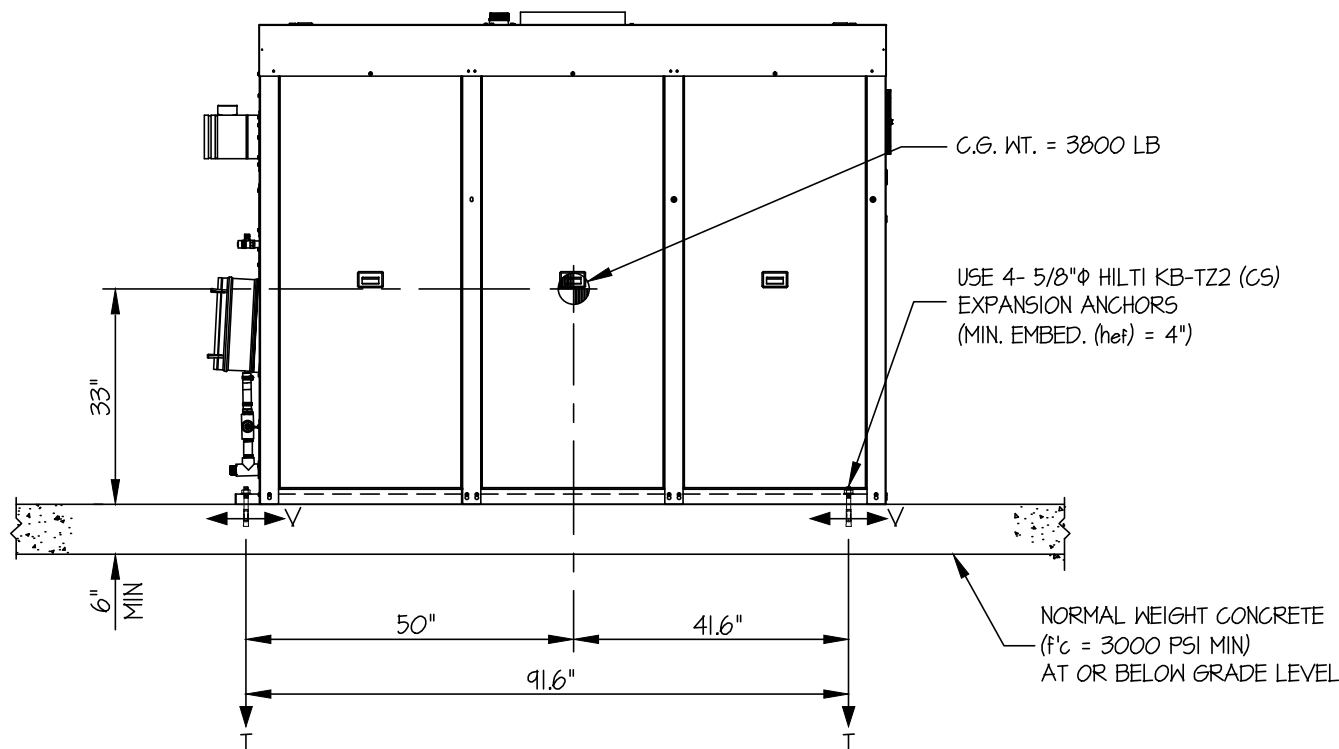
SHEET

2

OF 2 SHEETS

SEISMIC ANCHORAGE

SLAB ON GRADE



SIDE ELEVATION

LOADS:

WEIGHT ( $W_p$ ) = 3800 LB  
 HORIZONTAL FORCE ( $E_{mh}$ ) =  $1.71 W_p$  = 6498 LB  
 VERTICAL FORCE ( $E_v$ ) =  $0.38 W_p$  = 1444 LB

ANCHOR SPEC: 5/8"  $\phi$  HILTI KB-TZ2 (CS); ( $h_{ef}$  = 4")

SPACING = 14" MIN

EDGE DISTANCE = 26" MIN;

$\phi T$  =  $0.75 \phi N_h$  = 3631 LB/ANCHOR (TENSION)

$\phi V$  =  $\phi V_h$  = 6668 LB/ANCHOR (SHEAR)

ANCHOR FORCES:

TENSION (T)

$$T_u \text{ MAXIMUM} = \left[ \frac{6498 \# (33") (16.7")}{1 \text{ BOLT } (91.6") (36")} \times (0.3) \right] + \frac{6498 \# (33") (50")}{1 \text{ BOLT } (36") (91.6")} - \frac{(3800 \# (0.9) - 1444 \# (16.7") (50"))}{1 \text{ BOLT } (36") (91.6")} = 3077 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_u \text{ MAXIMUM} = \left[ \frac{6498 \# (19.3")}{2 \text{ BOLTS } (36")} \times (0.3) \right] + \frac{6498 \# (50")}{2 \text{ BOLTS } (91.6")} = 2296 \text{ LB/BOLT (MAX)}$$

INTERACTION:

$$\left( \frac{T_u}{\phi T} \right) + \left( \frac{V_u}{\phi V} \right) \leq 1.2 \quad \left( \frac{3077}{3631} \right) + \left( \frac{2296}{6668} \right) = 1.19 \leq 1.2 \quad \therefore \text{O.K.}$$

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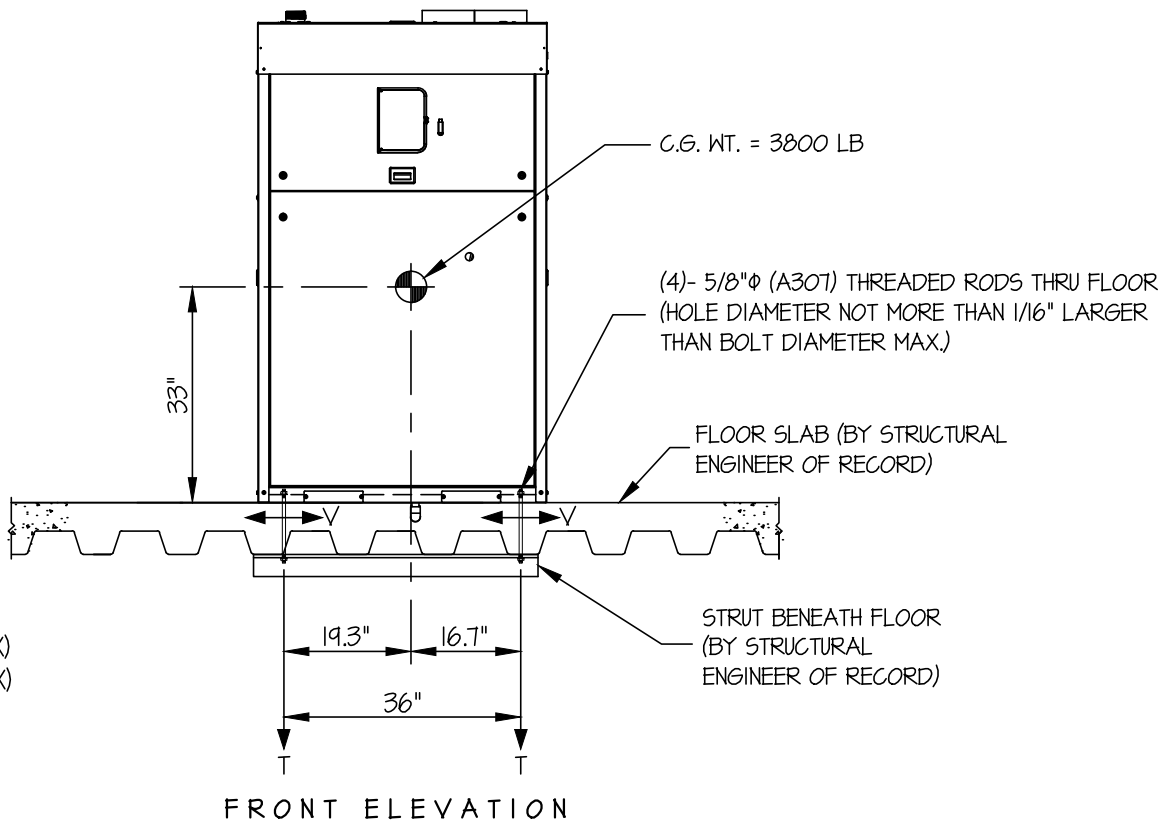
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1

OF 2 SHEETS

SEISMIC ANCHORAGE

UPPER FLOOR



$T_u = 3049$  LB/BOLT (MAX)  
 $V_u = 2229$  LB/BOLT (MAX)

FRONT ELEVATION

**NOTES:**

- FORCES ARE DETERMINED PER 2022 CALIFORNIA BUILDING CODE AND ASCE 7-16. STRENGTH DESIGN IS USED. (EXAMPLE:  $S_{ds} = 2.30$ ,  $a_p = 1.0$ ,  $I_p = 1.5$ ,  $R_p = 2.5$ ,  $z/h \leq 1$ )

HORIZONTAL FORCE ( $E_h$ ) =  $1.66 W_p$

VERTICAL FORCE ( $E_v$ ) =  $0.46 W_p$

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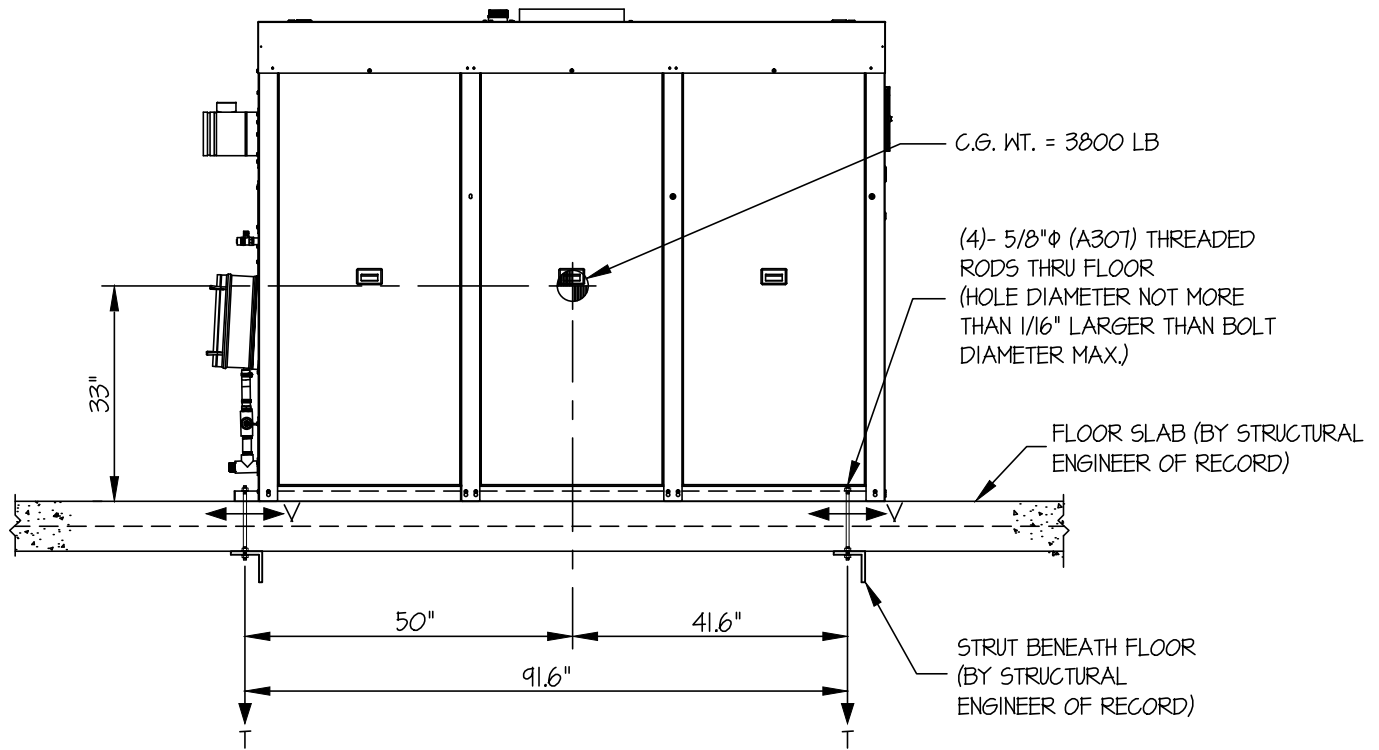
SHEET

2

OF 2 SHEETS

SEISMIC ANCHORAGE

UPPER FLOOR



SIDE ELEVATION

LOADS:

WEIGHT ( $W_p$ ) = 3800 LB  
 HORIZONTAL FORCE ( $E_h$ ) = 1.66  $W_p$  = 6308 LB  
 VERTICAL FORCE ( $E_v$ ) = 0.46  $W_p$  = 1748 LB

ANCHOR SPECS: 5/8"φ (A307) THREADED ROD

$\phi T$  = 9870 LB/ANCHOR (TENSION)  
 $\phi V$  = 5890 LB/ANCHOR (SHEAR)

ANCHOR FORCES:

TENSION (T)

$$T_U \text{ MAXIMUM} = \left[ \frac{6308\#(33'')(16.7'')}{1 \text{ BOLT } (91.6'')(36'')} \times (0.3) \right] + \frac{6308\#(33'')(50'')}{1 \text{ BOLT } (36'')(91.6'')} - \frac{(3800\#(0.9) - 1748\#)(16.7'')(50'')}{1 \text{ BOLT } (36'')(91.6'')} = 3049 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_U \text{ MAXIMUM} = \left[ \frac{6308\#(19.3'')}{2 \text{ BOLTS } (36'')} \times (0.3) \right] + \frac{6308\#(50'')}{2 \text{ BOLTS } (91.6'')} = 2229 \text{ LB/BOLT (MAX)}$$