

PATTERSON KELLEY

DES. J. ROBERSON

SHEET

JOB NO. 11-2304

1

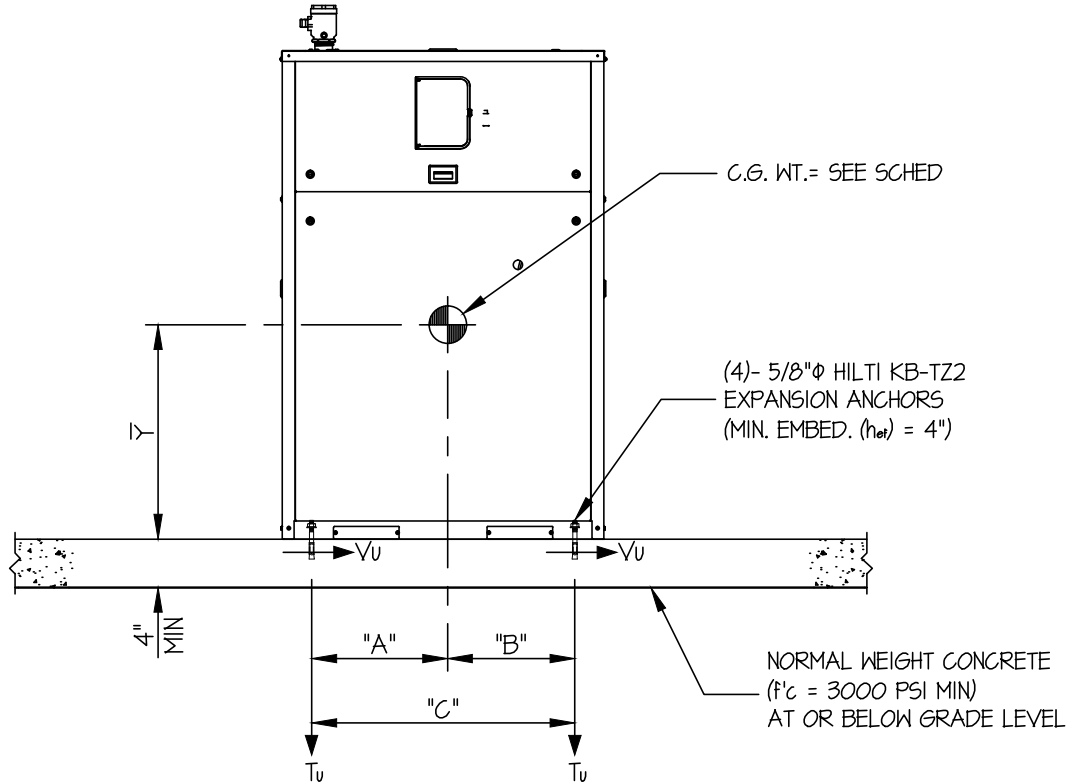
DATE 2/15/23

OF 2 SHEETS

STORM MODELS 2500/3000 & 3500/4000 CONDENSING BOILERS

SEISMIC ANCHORAGE

SLAB ON GRADE



FRONT ELEVATION

NOTES:

- FORCES ARE DETERMINED PER 2022 CALIFORNIA BUILDING CODE AND ASCE 7-16. STRENGTH DESIGN IS USED. (EXAMPLE: $S_{Ds} = 2.30$, $a_p = 1.0$, $I_p = 1.5$, $R_p = 2.5$, $\Omega_o = 2.0$, $z/h = 0$)

HORIZONTAL FORCE (E_h) = 1.035 W_p

HORIZONTAL FORCE (E_{mh}) = 2.07 W_p (FOR CONCRETE ANCHORAGE)

VERTICAL FORCE (E_v) = 0.46 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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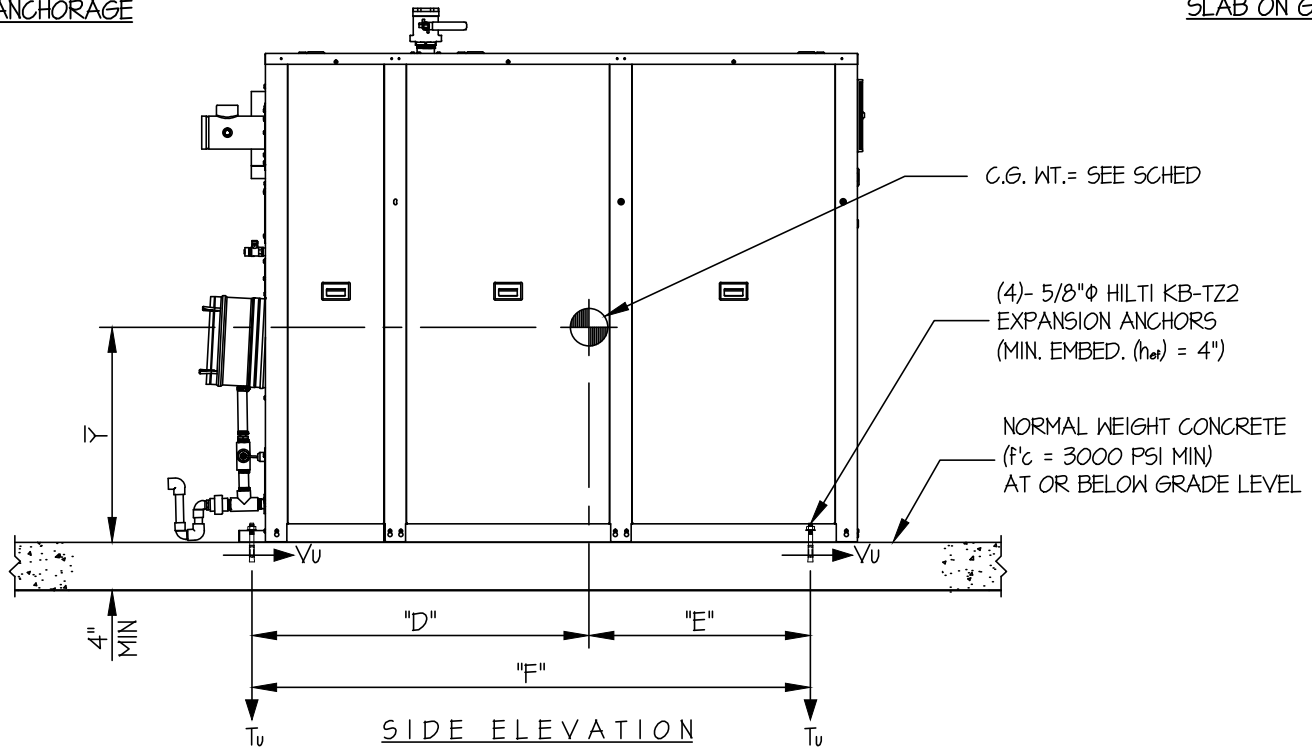
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SEISMIC ANCHORAGE

SLAB ON GRADE



MODEL	TOTAL WEIGHT (lb.)	\bar{Y} (in.)	"A" (in.)	"B" (in.)	"C" (in.)	"D" (in.)	"E" (in.)	"F" (in.)	Tu (lb.)	Vu (lb.)
2500/3000	2329	29.64	18.31	17.69	36	32.56	28.19	60.75	2207	1660
* 3500/4000	2772	29.28	18.72	17.28	36	41.26	35.73	76.99	2502	1985

* THIS UNIT IS USED IN CALCULATIONS

LOADS:

WEIGHT (W_p) = 2772 LB
 HORIZONTAL FORCE (E_{mh}) = $2.07 W_p$ = 5738 LB
 VERTICAL FORCE (E_v) = $0.46 W_p$ = 1275 LB

ANCHOR SPEC: $3/8"$ ϕ HILTI KB-TZ2: (h_{ef} = 4")
 SPACING = 14" MIN
 EDGE DISTANCE = 26" MIN:
 ϕT = $0.75 \phi N_n$ = 3632 LB/ANCHOR (TENSION)
 ϕV = ϕV_n = 6668 LB/ANCHOR (SHEAR)

ANCHOR FORCES:

TENSION (T)

$$T_u \text{ MAXIMUM} = \left[\frac{5738 \# (29.28") (17.28")}{1 \text{ BOLT } (76.99") (36")} \times (0.3) \right] + \frac{5738 \# (29.28") (41.26")}{1 \text{ BOLT } (36") (76.99")} - \frac{(2772 \# (0.9) - 1275 \# (17.28") (41.26"))}{1 \text{ BOLT } (36") (76.99")} = 2502 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_u \text{ MAXIMUM} = \left[\frac{5738 \# (18.72")}{2 \text{ BOLTS } (36")} \times (0.3) \right] + \frac{5738 \# (41.26")}{2 \text{ BOLTS } (76.99")} = 1985 \text{ LB/BOLT (MAX)}$$

UNITY CHECK:

$$\left(\frac{T_u}{\phi T} \right) + \left(\frac{V_u}{\phi V} \right) \leq 12 \left(\frac{2502}{3632} \right) + \left(\frac{1985}{6668} \right) = 0.99 \leq 12 \therefore \text{OK}$$

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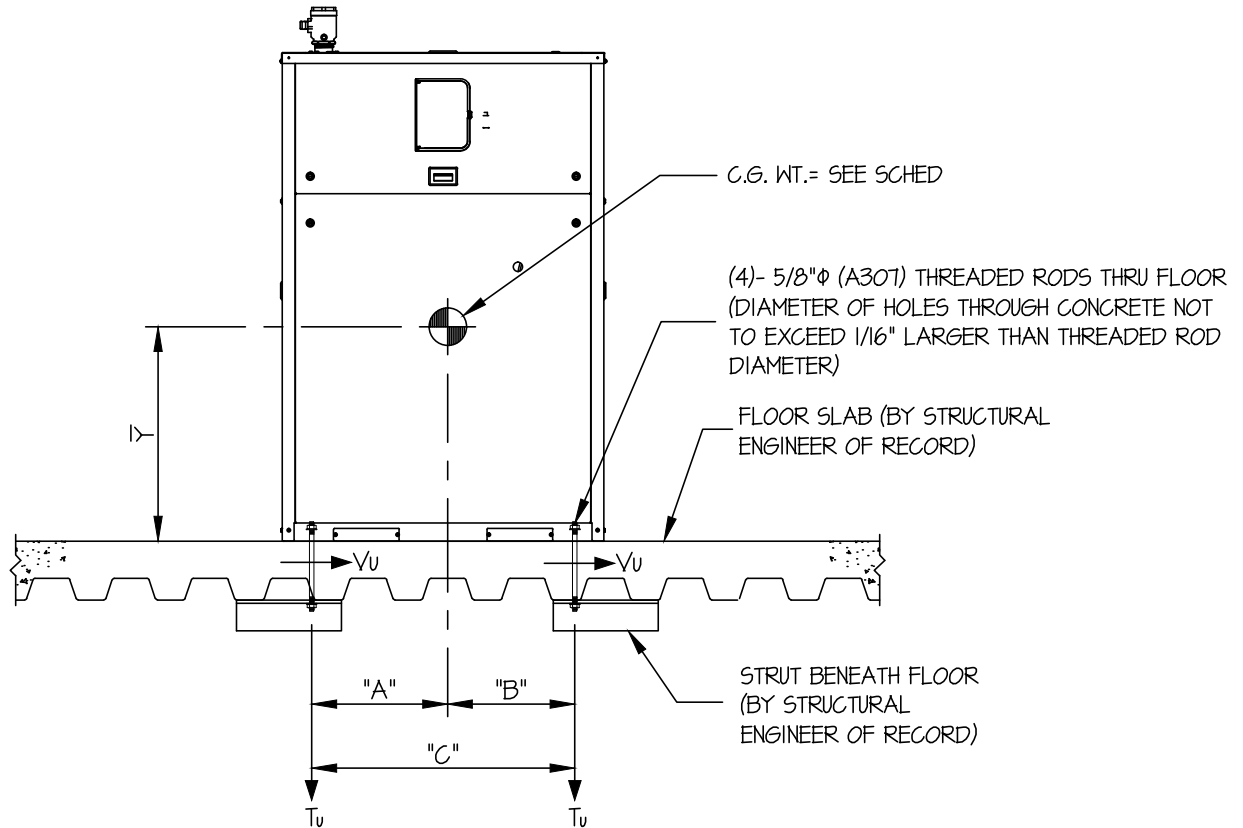
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OF 2 SHEETS

STORM MODELS 2500/3000 & 3500/4000 CONDENSING BOILERS

SEISMIC ANCHORAGE

UPPER FLOOR



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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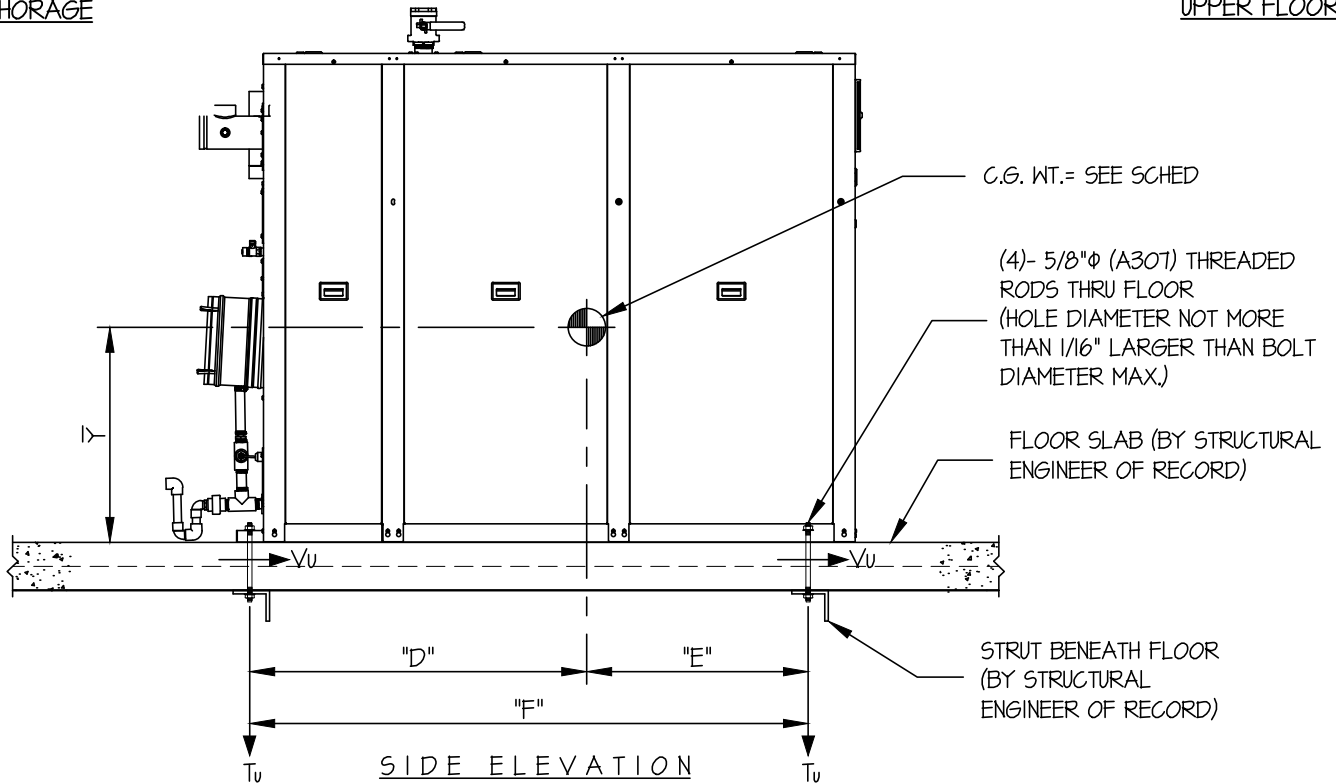
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SEISMIC ANCHORAGE

UPPER FLOOR



MODEL	TOTAL WEIGHT (lb)	ȳ (in)	"A" (in)	"B" (in)	"C" (in)	"D" (in)	"E" (in)	"F" (in)	Tu (lb)	Vu (lb)
2500/3000	2329	29.64	18.31	17.69	36	32.56	28.19	60.75	1715	1331
* 3500/4000	2772	29.28	18.72	17.28	36	41.26	35.73	76.99	1944	1592

* THIS UNIT IS USED IN CALCULATIONS

LOADS:

WEIGHT (Wp) = 2772 LB
 HORIZONTAL FORCE (Emh) = 1.66 Wp = 4602 LB
 VERTICAL FORCE (Ev) = 0.46 Wp = 1275 LB

ANCHOR SPEC: 5/8"φ (A307) THREADED RODS

φT = 9830 LB/ANCHOR (TENSION)
 φV = 5890 LB/ANCHOR (SHEAR)

ANCHOR FORCES:

TENSION (T)

$$T_U \text{ MAXIMUM} = \left[\frac{4602\#(29.28\")(17.28\"){}}{1 \text{ BOLT}(76.99\")(36\"){}} \times (0.3) \right] + \frac{4602\#(29.28\")(41.26\"){}}{1 \text{ BOLT}(36\")(76.99\"){}} - \frac{(2772\#(0.9) - 1275\#)(17.28\")(41.26\"){}}{1 \text{ BOLT}(36\")(76.99\"){}} = 1944 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_U \text{ MAXIMUM} = \left[\frac{4602\#(18.72\"){}}{2 \text{ BOLTS}(36\"){}} \times (0.3) \right] + \frac{4602\#(41.26\"){}}{2 \text{ BOLTS}(76.99\"){}} = 1592 \text{ LB/BOLT (MAX)}$$