

PATTERSON-KELLEY

SOLIS 2500-3000 BOILER

DES. J. ROBERSON

JOB NO. 11-2315

DATE 7/5/23

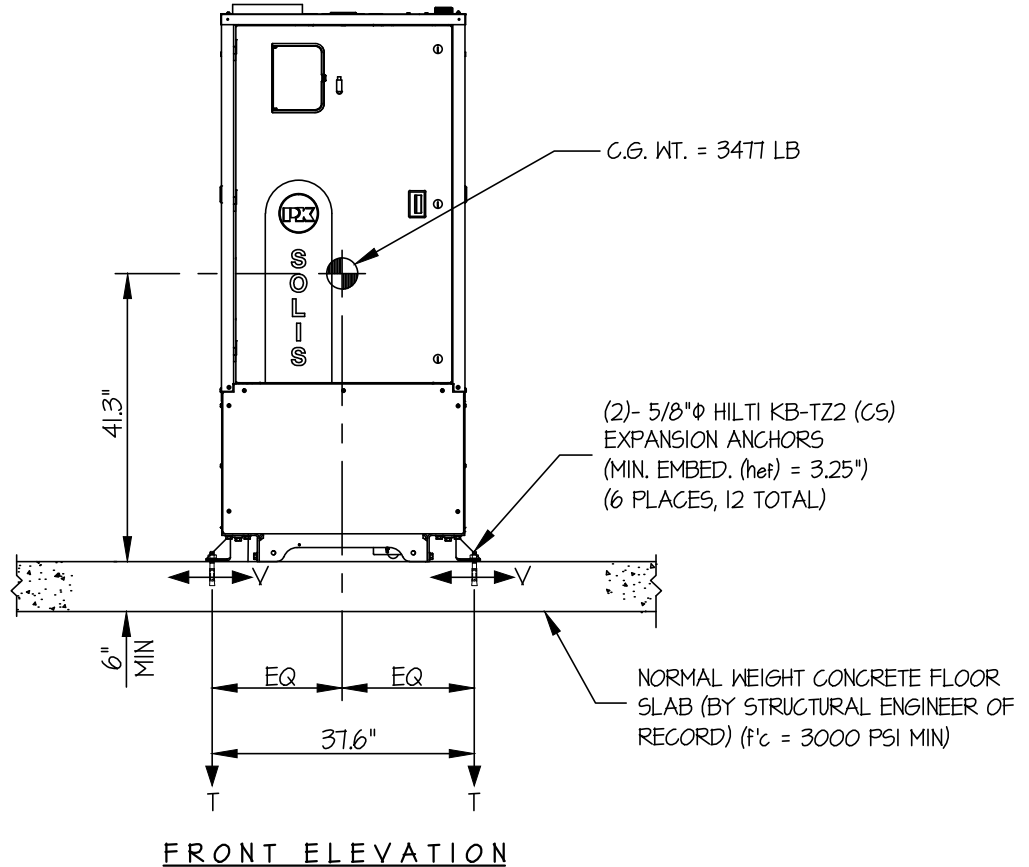
SHEET

1

OF 2 SHEETS

SEISMIC ANCHORAGE

SLAB ON GRADE



T_u = 1870 LB/BOLT (MAX)
 V_u = 745 LB/BOLT (MAX)

NOTES:

- FORCES ARE DETERMINED PER 2022 CALIFORNIA BUILDING CODE AND ASCE 7-16. STRENGTH DESIGN IS USED. (EXAMPLE: $S_{ds} = 2.20$, $a_p = 1.0$, $I_p = 1.5$, $R_p = 2.5$, $\Omega_o = 2.0$, $z/h = 0$)
 - HORIZONTAL FORCE (E_h) = $0.99 W_p$
 - HORIZONTAL FORCE (E_{mh}) = $1.98 W_p$ (FOR CONCRETE ANCHORAGE)
 - VERTICAL FORCE (E_v) = $0.44 W_p$
- 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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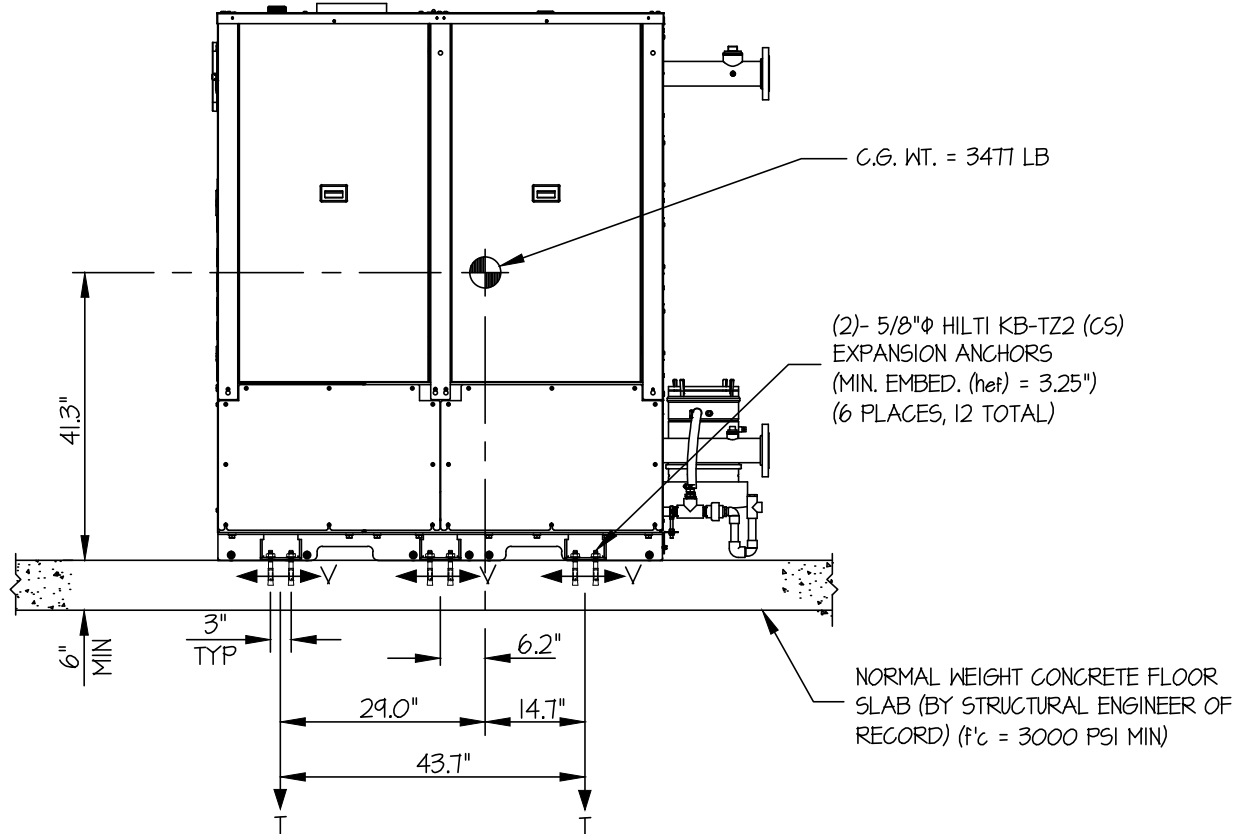
SHEET

2

OF 2 SHEETS

SEISMIC ANCHORAGE

SLAB ON GRADE



SIDE ELEVATION

LOADS:

WEIGHT (W_p) = 3477 LB
 HORIZONTAL FORCE (E_{mh}) = 1.98 W_p = 6884 LB
 VERTICAL FORCE (E_v) = 0.44 W_p = 1530 LB

ANCHOR SPEC: 5/8" ϕ HILTI KB-TZ2 (CS); (h_{ef} = 3.25")
 SPACING = 3" MIN
 EDGE DISTANCE = 32" MIN;
 ϕT = 0.75 ϕN_n = 2148 LB/ANCHOR (TENSION)
 ϕV = ϕV_n = 6169 LB/ANCHOR (SHEAR)

ANCHOR FORCES:

TENSION (T)

$$T_u \text{ MAXIMUM} = \left[\frac{6884\#(41.3')(29")}{4 \text{ BOLTS } (37.6')(43.7')} \times (0.3) \right] + \frac{6884\#(41.3')}{4 \text{ BOLTS } (43.7')} - \frac{(3477\#(0.9) - 1530\#)(29")}{8 \text{ BOLTS } (43.7')} = 1870 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_u \text{ MAXIMUM} = \left[\frac{6884\#}{12 \text{ BOLTS}} \times (0.3) \right] + \frac{6884\#(29")}{8 \text{ BOLTS } (43.7')} = 745 \text{ LB/BOLT (MAX)}$$

INTERACTION:

$$\left(\frac{T_u}{\phi T} \right) + \left(\frac{V_u}{\phi V} \right) \leq 1.2 \left(\frac{1870}{2148} \right) + \left(\frac{745}{6169} \right) = 0.99 \leq 1.2 \therefore \text{O.K.}$$

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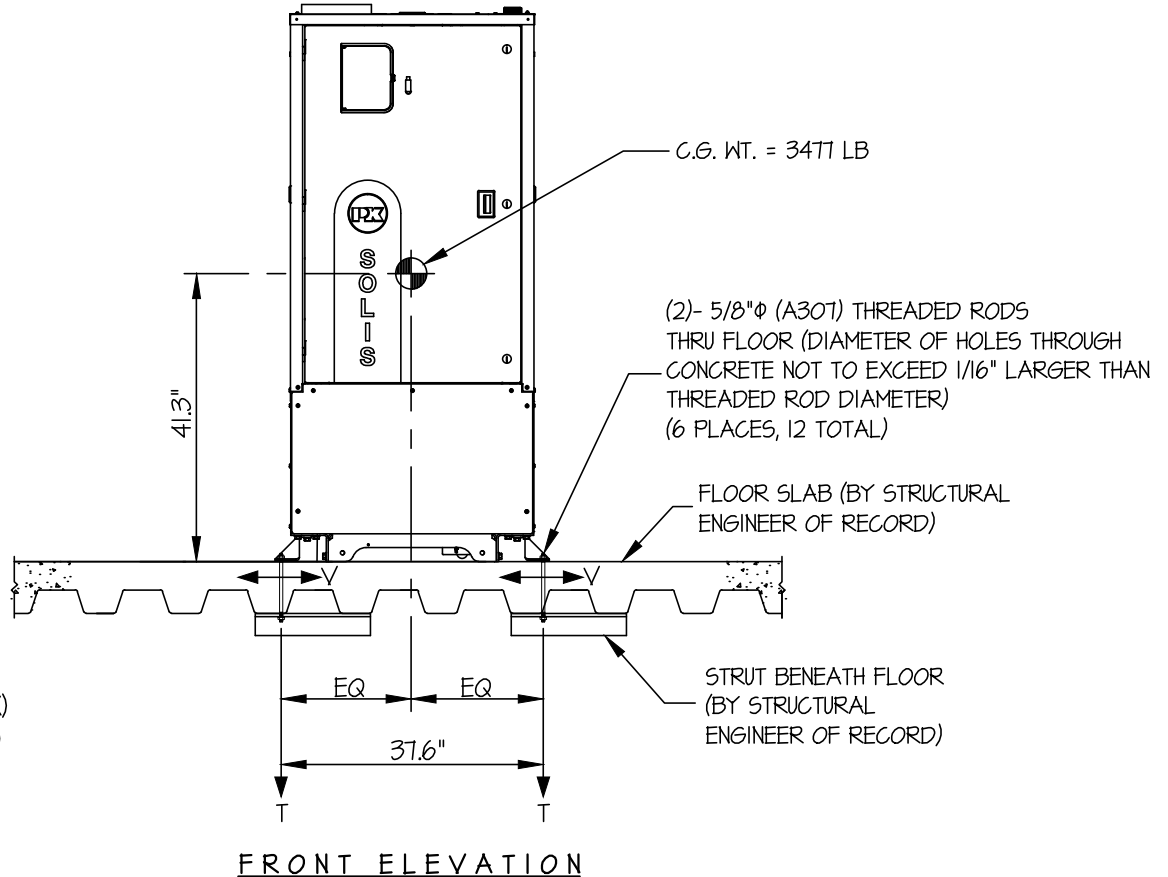
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SEISMIC ANCHORAGE

UPPER FLOOR



$T_u = 1552 \text{ LB/BOLT (MAX)}$
 $V_u = 625 \text{ LB/BOLT (MAX)}$

NOTES:

1. 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) = $0.46 W_p$

2. THIS CALCULATION ENCOMPASSES WEIGHTS AND VERTICAL C.G. POSITIONS NOT EXCEEDING VALUES SHOWN.

3. 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.

4. 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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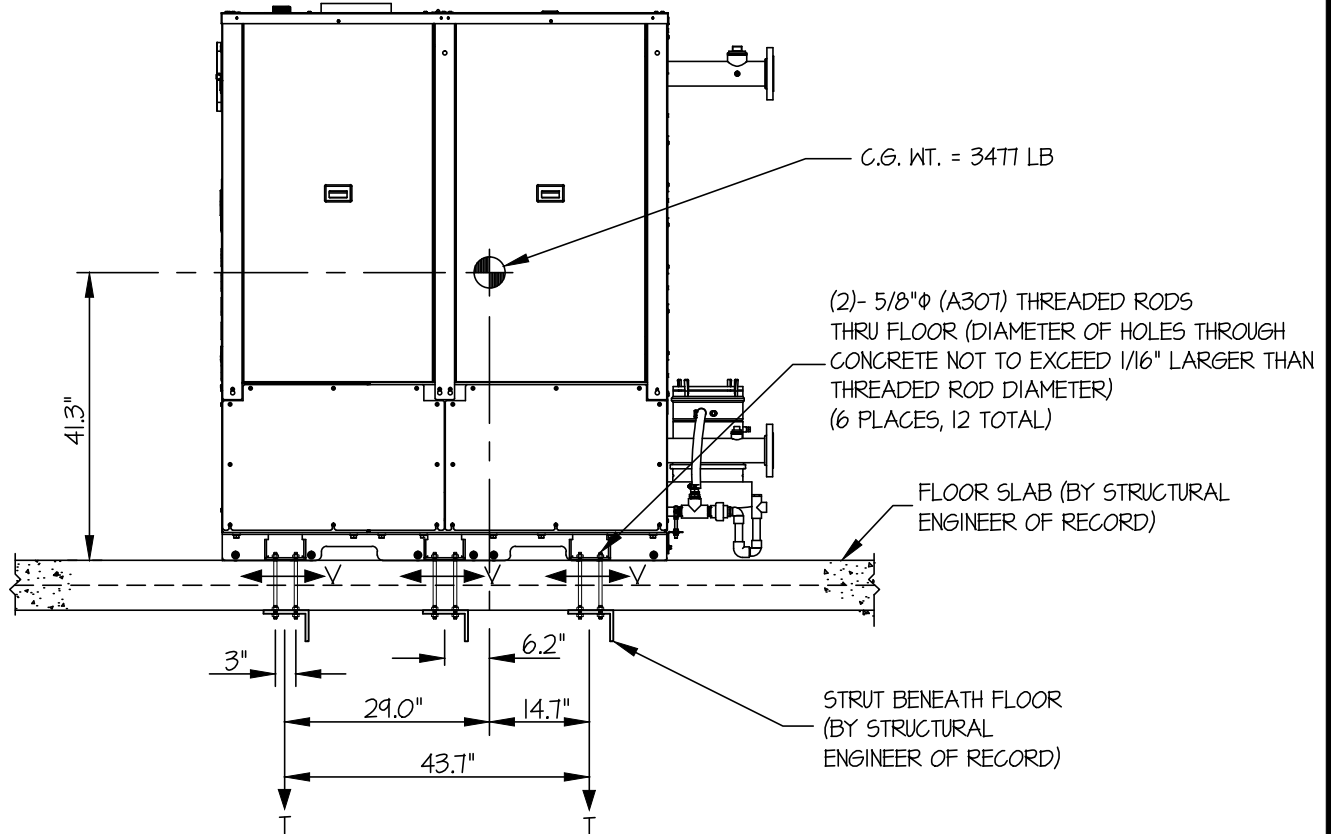
SHEET

2

OF 2 SHEETS

SEISMIC ANCHORAGE

UPPER FLOOR



SIDE ELEVATION

LOADS:

WEIGHT (W_p) = 3477 LB
 HORIZONTAL FORCE (E_h) = 1.66 W_p = 5772 LB
 VERTICAL FORCE (E_v) = 0.46 W_p = 1599 LB

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

φT= 9870 LB/BOLT (TENSION)
 φV= 5890 LB/BOLT (SHEAR)

ANCHOR FORCES:

TENSION (T)

$$T_U \text{ MAXIMUM} = \left[\frac{5772\#(41.3'')(29'')}{4 \text{ BOLTS } (37.6'')(43.7'')} \times (0.3) \right] + \frac{5772\#(41.3'')}{4 \text{ BOLTS } (43.7'')} - \frac{(3477\#(0.9) - 1599\#(29''))}{8 \text{ BOLTS } (43.7'')} = 1552 \text{ LB/BOLT (MAX)}$$

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

SHEAR (V)

$$V_U \text{ MAXIMUM} = \left[\frac{5772\#}{12 \text{ BOLTS}} \times (0.3) \right] + \frac{5772\#(29'')}{8 \text{ BOLTS } (43.7'')} = 625 \text{ LB/BOLT (MAX)}$$

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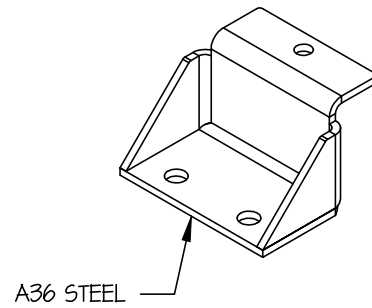
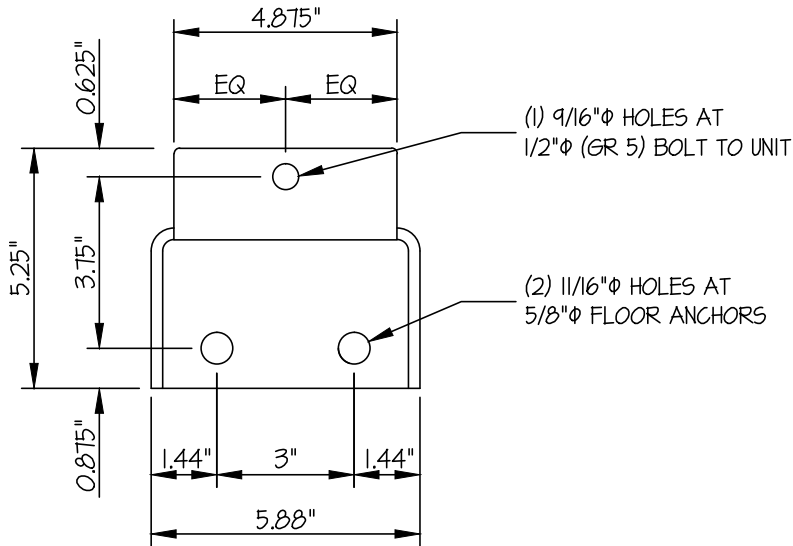
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OF 1 SHEETS

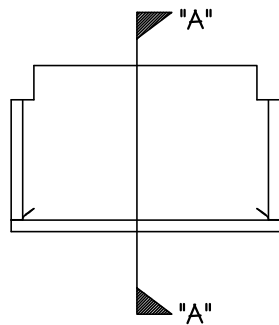
SEISMIC ANCHORAGE

BRACKET DETAILS

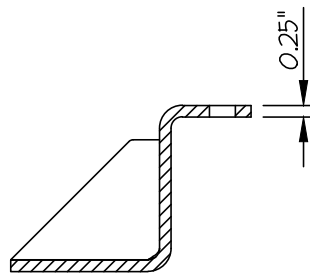


TOP

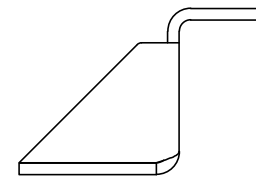
ISOMETRIC



FRONT



SECTION "A"- "A"



RIGHT

FLOOR ANCHOR BRACKET