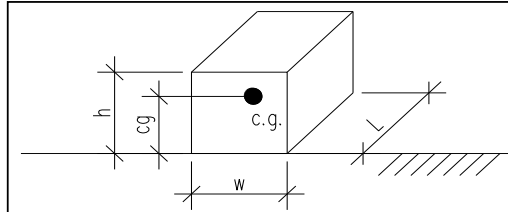


HYDROTHERM KN-4 BOILER SEISMIC ANCHORAGE (ASCE 7-05)
Slab on Grade Applications Only

Equipment Parameters:

weight, W_p =	781.00	LBS.
w =	18.75	in.
L =	25.81	in.
h =	51.88	in.
cg =	27.38	in.



Seismic Parameters:

S_s =	1.798	ASCE 7-05 Figure 22-1)	Site Class =	C
a_p =	1.000	(ASCE 7-05 Table 13.6-1)		
I_p =	1.250	(ASCE Table 11.5-1)	Seismic Use Group =	II

R_p =	2.500	(Default value for Anchorage per ASCE 7-05 Table 13.6-1)
F_a =	1.000	(ASCE 7-05 Table 11.4-1)
$S_{MS} = F_a * S_s$ =	1.798	(ASCE 7-05 Eqn. 11.4-1)
$S_{DS} = 2/3 * S_{MS}$ =	1.199	(ASCE 7-05 Eqn. 11.4-3)

Seismic Design Category = **D**

Seismic Force:

$F_p = (0.4 * a_p * S_{DS} * W_p) / (R_p / I_p)$ =	187.2	LBS. (ASCE 7-05 Eqn. 13.3-1)
Upper Limit: $F_{pMAX} = 1.6 * S_{DS} * I_p * W_p$ =	1872.3	LBS. (ASCE 7-05 Eqn. 13.3-2)
Lower Bound: $F_{pMIN} = 0.3 * S_{DS} * I_p * W_p$ =	351.1	LBS. (ASCE 7-05 Eqn. 13.3-3)
$F_{p, DESIGN}$ =	351.1	LBS.

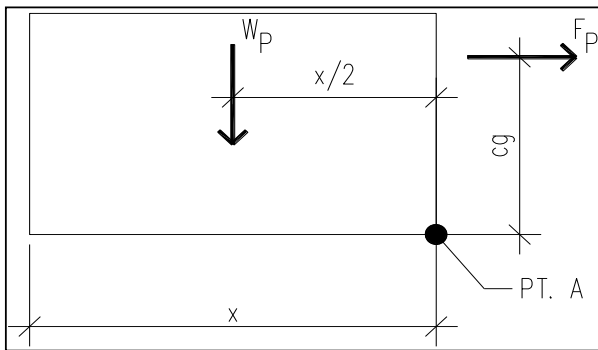
HYDROTHERM KN-4 BOILER SEISMIC ANCHORAGE (ASCE 7-05)

Design Anchorage Force:

Horizontal Shear Force Per Anchor:

$$R_H = F_p/4 = \boxed{87.8} \text{ LBS.}$$

Overtuning Resistance About Point A:



$$x = \boxed{18.75} \text{ in.}$$

$x = \text{lesser of } L \text{ or } W$

$$M_{OT} = F_p * cg = \boxed{801.0} \text{ LBS.-FT.}$$

$$M_{RES} = W_p * x/2 = \boxed{610.2} \text{ LBS.-FT. Uplift}$$

Vertical Acceleration: assume $\rho = 1.0$

$$E_v = \rho * F_p + 0.2 * S_{DS} * W = \boxed{275.0} \text{ LBS. (ASCE Section 13.3.1)}$$

$$R_{VNETUP} = (M_{OT}/(2*x)) - (W_p/4) + (E_v/4) = \boxed{0.0} \text{ LBS. No Uplift}$$

Force Summary Per Corner:

Component Anchorage:

$$R_{HNET} = \boxed{87.8} \text{ LBS.}$$

$$R_{VNETUP} = \boxed{0.0} \text{ LBS.}$$

Anchors Embedded in Concrete or CMU:

$$1.3 * R_p * R_{HNET} = \boxed{285.2} \text{ LBS.}$$

$$1.3 * R_p * R_{VNETUP} = \boxed{0.0} \text{ LBS.}$$