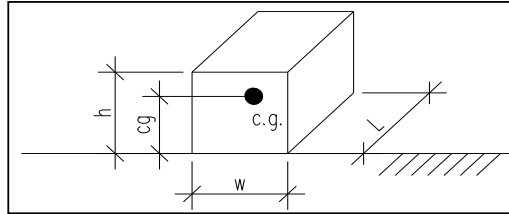


HYDROTHERM KN-30 BOILER SEISMIC ANCHORAGE (ASCE 7-05)

Slab on Grade Applications Only

Equipment Parameters:

weight, $W_p = 3785.00$ LBS.
 $w = 25.06$ in.
 $L = 69.46$ in.
 $h = 74.32$ in.
 $cg = 31.85$ in.



Seismic Parameters:

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

$R_p = 2.500$ (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 =

Seismic Force:

$F_p = (0.4 * a_p * S_{DS} * W_p) / (R_p / I_p) = 725.9$ LBS. (ASCE 7-05 Eqn. 13.3-1)
 Upper Limit: $F_{pMAX} = 1.6 * S_{DS} * I_p * W_p = 7259.1$ LBS. (ASCE 7-05 Eqn. 13.3-2)
 Lower Bound: $F_{pMIN} = 0.3 * S_{DS} * I_p * W_p = 1361.1$ LBS. (ASCE 7-05 Eqn. 13.3-3)
 $F_{p, DESIGN} = 1361.1$ LBS.

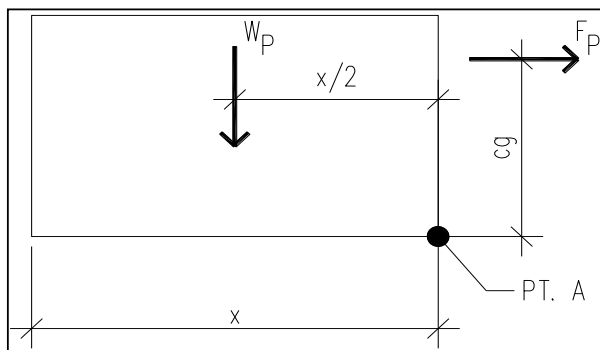
HYDROTHERM KN-30 BOILER SEISMIC ANCHORAGE (ASCE 7-05)

Design Anchorage Force:

Horizontal Shear Force Per Anchor:

$$R_H = F_p/4 = \boxed{340.3} \text{ LBS.}$$

Overtuning Resistance About Point A:



$$x = \boxed{25.06} \text{ in.}$$

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

$$M_{OT} = F_p * cg = \boxed{3612.5} \text{ LBS.-FT.}$$

$$M_{RES} = W_p * x/2 = \boxed{3952.2} \text{ LBS.-FT. OK, No Uplift}$$

Vertical Acceleration: assume $\rho = 1.0$

$$E_v = \rho * F_p + 0.2 * S_{DS} * W = \boxed{1247.7} \text{ LBS. (ASCE Section 13.3.1)}$$

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

Force Summary Per Corner:

Component Anchorage:

$$R_{HNET} = \boxed{340.3} \text{ LBS.}$$

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

Anchors Embedded in Concrete or CMU:

$$1.3 * R_p * R_{HNET} = \boxed{1105.9} \text{ LBS.}$$

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