RBI TORUS 0350 INDOOR DUAL FUEL - SEISMIC ANCHORAGE (ASCE 7-16/IBC 2000)
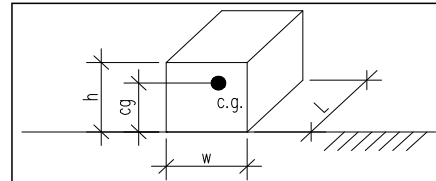
Slab on Grade Applications Only

Equipment Parameters:

weight, W_p = 386.55 LBS.
w = 25.09 in.
L = 40.25 in.
h = 40.94 in.
cg = 17.29 in.

Seismic Parameters:

S_S = 1.800 ASCE 7-16 Figure 22-1 using 84th percentile value   Site Class = D

a_p = 1.000 (ASCE 7-16 Table 13.6-1)

I_p = 1.500 (ASCE 7-16 Table 13.1.3)   Seismic Use Group = IV

R_p = 1.500 (Default value for Anchorage per ASCE 7-16 13.6-1)

F_a = 1.032 (ASCE 7-16 Table 11.4-1)

$S_{MS} = F_a * S_s$ = 1.858 (ASCE 7-16 Eqn. 11.4-1)

$S_{DS} = 2/3 * S_{MS}$ = 1.239 (ASCE 7-16 Eqn. 11.4-3)

Seismic Design Category = **D**

Seismic Force:

$F_p = (0.4 * a_p * S_{DS} * W_p)/(R_p/I_p)$ = **191.6** LBS. (ASCE 7-16 Eqn. 13.3-1)

Upper Limit: $F_{pMAX} = 1.6 * S_{DS} * I_p * W_p$ = **1149.4** LBS. (ASCE 7-16 Eqn. 13.3-2)

Lower Bound: $F_{pMIN} = 0.3 * S_{DS} * I_p * W_p$ = **215.5** LBS. (ASCE 7-16 Eqn. 13.3-3)
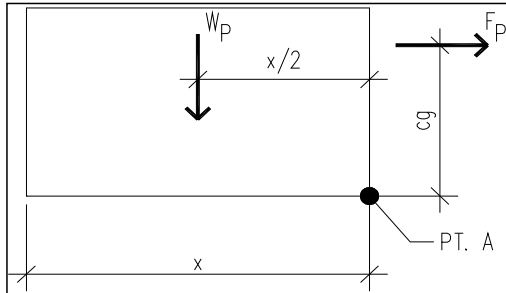
$F_{p, DESIGN}$ = **215.5** LBS.

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<u>Design Anchorage Force:</u>

Horizontal Shear Force Per Anchor:

$$R_H = F_p/4 = \boxed{53.9} \text{ LBS.}$$

Overturning Resistance About Point A:

$$x = \boxed{40.25} \text{ in.}$$
$$x = \text{lesser of L or h}$$

$$M_{OT} = F_p \cdot cg = \boxed{3726.2} \text{ LBS.-FT.}$$

$$M_{RES} = W_p \cdot x/2 = \boxed{7779.3} \text{ LBS.-FT.} \quad \textbf{OK, No Uplift}$$

Vertical Acceleration: assume $\rho = 1.0$

$$Ev = \rho \cdot Fp + 0.2 \cdot S_{DS} \cdot W = \boxed{149.7} \text{ LBS. (IBC Eqn. 1617.1.1)}$$

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

<u>Force Summary Per Corner:</u>
   <u>Component Anchorage:</u>

$$R_{HNET} = \boxed{53.9} \text{ LBS.}$$
$$R_{VNETUP} = \boxed{0.0} \text{ LBS.}$$

   <u>Anchors Embedded in Concrete or CMU:</u>

$$1.3 \cdot R_p \cdot R_{HNET} = \boxed{105.1} \text{ LBS. (IBC 1617.1.7 \#2)}$$
$$1.3 \cdot R_p \cdot R_{VNETUP} = \boxed{0.0} \text{ LBS. (IBC 1617.1.7 \#2)}$$