HYDROTHERM KN-16 BOILER SEISMIC ANCHORAGE (ASCE 7-05)

Slab on Grade Applications Only

Equipment Parameters:

- Weight, \( W_p = 2360.00 \) LBS.
- \( w = 25.06 \) in.
- \( L = 46.88 \) in.
- \( h = 74.06 \) in.
- \( cg = 31.63 \) in.

Seismic Parameters:

- \( S_s = 1.798 \) ASCE 7-05 Figure 22-1)
- \( a_p = 1.000 \) (ASCE 7-05 Table 13.6-1)
- \( I_p = 1.000 \) (ASCE Table 11.5-1)

Seismic Design Category = D

Seismic Force:

- \( F_p = (0.4*a_p*S_{DS}*W_p)/(R_p/I_p) = 452.6 \) LBS. (ASCE 7-05 Eqn. 13.3-1)
- Upper Limit: \( F_{pMAX} = 1.6*S_{DS}*I_p*W_p = 4526.2 \) LBS. (ASCE 7-05 Eqn. 13.3-2)
- Lower Bound: \( F_{pMIN} = 0.3*S_{DS}*I_p*W_p = 848.7 \) LBS. (ASCE 7-05 Eqn. 13.3-3)

Seismic Force = 848.7 LBS.
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Design Anchorage Force:

Horizontal Shear Force Per Anchor:

\[ R_h = \frac{F_p}{4} = 212.2 \text{ LBS.} \]

Overturning Resistance About Point A:

\[ M_{OT} = F_p \cdot cg = 2236.6 \text{ LBS.-FT.} \]
\[ M_{RES} = W_p \cdot \frac{x}{2} = 2464.2 \text{ LBS.-FT.} \quad \text{OK, No Uplift} \]

Vertical Acceleration: assume \( \rho = 1.0 \)

\[ E_v = \rho \cdot F_p + 0.2 \cdot S_{ds} \cdot W = 777.9 \text{ LBS. (ASCE Section 13.3.1)} \]
\[ R_{VNETUP} = \left(\frac{M_{OT}}{2x}\right) - \frac{W_p}{4} + \frac{E_v}{4} = 0.0 \text{ LBS. No Uplift} \]

Force Summary Per Corner:

Component Anchorage:

\[ R_{HNET} = 212.2 \text{ LBS.} \]
\[ R_{VNETUP} = 0.0 \text{ LBS.} \]

Anchors Embedded in Concrete or CMU:

\[ 1.3 \cdot R_p \cdot R_{HNET} = 689.5 \text{ LBS.} \]
\[ 1.3 \cdot R_p \cdot R_{VNETUP} = 0.0 \text{ LBS.} \]