HYDROTHERM KN-6 BOILER SEISMIC ANCHORAGE (ASCE 7-05)

Slab on Grade Applications Only

Equipment Parameters:

weight, \( W_p = 1089.00 \) LBS.

\( w = 25.00 \) in.

\( L = 27.88 \) in.

\( h = 56.80 \) in.

\( c_g = 33.13 \) in.

Seismic Parameters:

\( S_S = 1.798 \) (ASCE 7-05 Figure 22-1)

\( a_p = 1.000 \) (ASCE 7-05 Table 13.6-1)

\( I_p = 1.250 \) (ASCE Table 11.5-1)

Seismic Use Group = R

\( S_{MS} = F_a S_S = 1.798 \) (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 = C

Seismic Force:

\[ F_p = \frac{(0.4 a_p S_{DS} W_p)}{(R_p / I_p)} = 261.1 \] LBS. (ASCE 7-05 Eqn. 11.4-1)

Upper Limit: \( F_{p,MAX} = 1.6 S_{DS} I_p W_p = 2610.7 \) LBS. (ASCE 7-05 Eqn. 13.3-2)

Lower Bound: \( F_{p,MIN} = 0.3 S_{DS} I_p W_p = 489.5 \) LBS. (ASCE 7-05 Eqn. 13.3-3)

\[ F_{p,DESIGN} = 489.5 \] LBS.
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Design Anchorage Force:

Horizontal Shear Force Per Anchor:

\[ R_H = \frac{F_p}{4} = 122.4 \text{ LBS.} \]

Overturning Resistance About Point A:

\[ F_{TP} = 1351.2 \text{ LBS.-FT.} \]
\[ x = 25.00 \text{ in.} \]
\[ x = \text{lesser of } L \text{ or } W \]

\[ W_p = 1134.4 \text{ LBS.-FT. Uplift} \]

Vertical Acceleration:

\[ Ev = \rho F_p + 0.2 S_{DS} W = 383.4 \text{ LBS. (ASCE Section 13.3.1)} \]

\[ R_{VNETUP} = \left( M_{OT}/(2x)\right) -(W_p/4)+(Ev/4) = 0.0 \text{ LBS. No Uplift} \]

Force Summary Per Corner:

Component Anchorage:

\[ R_{HNET} = 122.4 \text{ LBS.} \]
\[ R_{VNETUP} = 0.0 \text{ LBS.} \]

Anchors Embedded in Concrete or CMU:

\[ 1.3 R_p R_{HNET} = 397.7 \text{ LBS.} \]
\[ 1.3 R_p R_{VNETUP} = 0.0 \text{ LBS.} \]