Poisson's Ratio $\mu = 0.15$
Section Width $b = 1$ meter
Slab Thickness $h = 10.50$ in
Concrete Compressive Strength $F_c = 4,000.00$ psi
Modulus of Elasticity $E = 3,602,728.70$ psi
Concrete Flexural Strength $F_r = 600.00$ psi
Modulus of Subgrade Reaction $k = 100.00$ pci
Post Load $P = 12,000.00$ lb
Contact Area Dimensions $x = 6.00$ in, $y = 6.00$ in
Load Spacing $W = 42.00$ in, $L = 96.00$ in, $Z = 14.00$ in

Radius of Relative Stiffness

$$l = \frac{E \cdot h^3}{12(1 - \mu^2) \cdot k}$$

$$l = 43.37 \text{ in}$$

Load Percentage

<table>
<thead>
<tr>
<th>Main Rack</th>
<th>Adjacent Rack</th>
<th>Post System Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post</td>
<td>Post $Z$</td>
<td>Back to Back</td>
</tr>
<tr>
<td>$= 100.0%$</td>
<td>$= 40.3%$</td>
<td></td>
</tr>
<tr>
<td>Post $W$</td>
<td>Post $Z+L$</td>
<td></td>
</tr>
<tr>
<td>$= 12.9%$</td>
<td>$= 0.4%$</td>
<td></td>
</tr>
<tr>
<td>Post $L$</td>
<td>Post $Z+W$</td>
<td></td>
</tr>
<tr>
<td>$= 1.1%$</td>
<td>$= 11.7%$</td>
<td></td>
</tr>
<tr>
<td>Post $WL$</td>
<td>Post $(Z+L)W$</td>
<td></td>
</tr>
<tr>
<td>$= 0.7%$</td>
<td>$= 0.1%$</td>
<td></td>
</tr>
</tbody>
</table>

$A = 23,091.42$ lb

($10.31$ tonne)
Load Contact Radius - If Rack to Rack Distance(Sz) >= (2 * h) then

\[ a = \frac{x \cdot y}{\pi} \cdot 0.5 \]

else

\[ a = \frac{(Sw + x) \cdot y}{\pi} \cdot 0.5 \]

\[ a = 3.39 \text{ in} \]

\[ (0.09 \text{ m}) \]

If contact radius(a) < (1.72 * h) then

\[ b = \frac{1.6 \cdot a^2 + h^2}{0.5} - (0.675 \cdot h) \]

else

\[ b = a \]

\[ b = 4.25 \text{ in} \]

\[ (0.11 \text{ m}) \]

Slab Stress - Interior Loading

\[ f_b = 2.70 \cdot (1 + \mu) \cdot \left(\frac{P}{h^2}\right) \cdot (4.0 \cdot \log(R/b) + 1.069) \cdot 10^6 \]

\[ f_b = 333.09 \text{ psi} \]

\[ (2,296.60 \text{ kN/m}^2) \]

Interior Safety Factor

\[ FS = \frac{f_r}{f_b} \]

\[ \text{Corner} = 1.48 \]

\[ \text{Edge} = 1.28 \]

\[ FS = 1.80 \]
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