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\[ \Sigma M_{R_1} = 0 = 7.2(12) - R_2(24) + 6(28) \]
\[ R_2 = 10.6 \text{ k}\]

\[ \Sigma M_{R_2} = 0 = R_1(24) - 7.2(12) + 6(4) \]
\[ R_1 = 2.6 \text{ k}\]

Check \[ \Sigma F_Y = 10.6 + 2.6 - 7.2 - 6 = 0 \]

Shear:

<table>
<thead>
<tr>
<th>Location</th>
<th>Shear</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2.6k</td>
</tr>
<tr>
<td>8.67'</td>
<td>11.267k</td>
</tr>
<tr>
<td>12'</td>
<td>-4.6k</td>
</tr>
</tbody>
</table>

Moment:

\[ 11.267 \text{ k}\cdot\text{ft} \]

Design moment = 24.0 k\cdot\text{ft}
STRAIN COMPATIBILITY:

ASSUME WOOD CONTROLS STRAIN:

\[ e_\text{w} = \frac{f_\text{w}}{E_\text{w}} = 1.5 \times \frac{2000}{30000} = 0.00075 \]

\[ e_\text{s} = 30000 \times (0.00075) = 22.5 = \phi \]

\[ \phi \text{, STEEL AND WOOD HAVE BALANCED STRAIN AS IS} \]

FIND MOMENT CARRIED BY WOOD:

\[ M_\text{wood} = \frac{1}{2} S = 1.5 \times \left( \frac{4 \times 12^2}{6} \right) = 144 \text{ K-ft} = 12 \text{ K} \cdot \text{ft} \]

FIND MOMENT CARRIED BY STEEL:

\[ M_\text{steel} = M_{\text{total}} - M_\text{wood} = 24 - 12 = 12 \text{ K-ft} \]

FIND B OF STEEL PLATES:

\[ M_5 = f_5 S = f \left( \frac{b \cdot d^2}{6} \right) \times 2 = 22.5 \left( \frac{b \cdot 12^2}{6} \right) \times 2 = 12 \times 12 \]

\[ b = 1.33'' \]

FIND LENGTH OF PLATES (SEE MOMENT DIAGRAM)

WOOD WILL CARRY 12 K-FT ALONE, THEREFORE FIND PORTION OF MOMENT DIAGRAM > 12 K-FT

ON CANTILEVER:

\[ 6 \times 2 = 12 \quad f_1 = 2'' \]

BETWEEN SUPPORTS:

\[ 12 = l_2 (4.6 - 3.3) + \frac{l_2 (3.3)}{2} \]

\[ 0 = -0.15 l_2^2 + 4.6 l_2 - 12 \]

\[ l_2 = \frac{-4.6 \pm \sqrt{4.6^2 - 4(15)12}}{2(-15)} = 2.879'' \]

\[ l_{total} = l_1 + l_2 = 2 + 2.88 = 4.88'' \]