



T_b - bending torque

F_s - shear force

$$\sum F_{ix} = 0 \quad R_{Ax} = 0$$

$$\sum F_{iy} = 0 \quad R_{Ay} - P - 2P + R_B = 0$$

$$\sum T_{iA} = 0 \quad P \cdot l + 2P \cdot 2l - R_B \cdot 3l = 0$$

$$3R_B \cdot l = 5P \cdot l \quad /: l$$

$$3R_B = 5P \quad /: 3$$

$$R_B = \frac{5}{3}P$$

$$R_{Ay} = 3P - \frac{5}{3}P$$

$$R_{Ay} = \frac{4}{3}P$$

$$0 < x < l$$

$$F_s = R_{Ay}$$

$$T_b = R_{Ay} \cdot x$$

for $x = 0$

$$T_b = 0$$

for $x = l$

$$T_b = \frac{4}{3}P \cdot l$$

$$\left. \begin{matrix} x=0 \\ x=l \end{matrix} \right\} T = \frac{4}{3}P$$

$$l < x < 2l$$

$$F_s = R_{Ay} - P$$

$$T_b = R_{Ay} \cdot x - P \cdot (x - l)$$

for $x = l$

$$T_b = \frac{4}{3}P \cdot l$$

for $x = 2l$

$$T_b = \frac{4}{3}P \cdot 2l - P \cdot l$$

$$T_b = \frac{8}{3}P \cdot l - P \cdot l$$

$$T_b = \frac{5}{3}P \cdot l$$

$$\left. \begin{matrix} x=l \\ x=2l \end{matrix} \right\} F_s = \frac{4}{3}P - P$$

$$F_s = \frac{1}{3}P$$

$$2l < x < 3l$$

$$F_s = R_{Ay} - P - 2P$$

$$T_b = R_{Ay} \cdot x - P \cdot (x - l) - 2P \cdot (x - 2l)$$

for $x = 2l$

$$T_b = \frac{4}{3}P \cdot 2l - P \cdot l$$

$$T_b = \frac{5}{3}P \cdot l$$

for $x = 3l$

$$T_b = \frac{4}{3}P \cdot 3l - P \cdot 2l - 2P \cdot l$$

$$T_b = 4P \cdot l - 4P \cdot l$$

$$T_b = 0$$

$$\left. \begin{matrix} x=2l \\ x=3l \end{matrix} \right\} F_s = \frac{4}{3}P - P - 2P$$

$$F_s = \frac{4}{3}P - 3P$$

$$F_s = -1\frac{2}{3}P$$

$$F = \frac{T_{b,max}}{J_{2c}} \cdot y_{max} \leq k_g$$