

$$\sum \curvearrowleft R_A \times 100 - 2,5 \times 50 + 0,5 \times 50 = 0$$

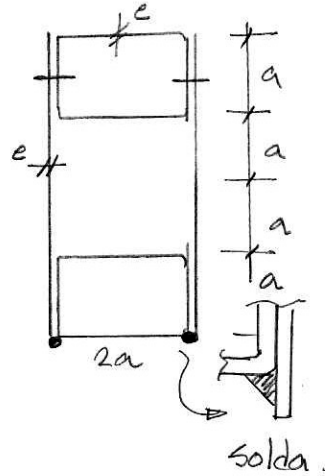
$$R_A = 1 \text{ kN} \quad R_B = 2 \text{ kN}$$

Tubo retangular:

$$\bar{S} = (4ea + 2ea) \times \frac{3}{2}a = 9ea^2$$

$$q = \frac{V\bar{S}}{I} = \frac{1,5 \times 9ea^2}{40ea^3} = \frac{27}{80a} = \frac{0,3375}{a}$$

$$q = 0,135 \text{ kN/cm}$$



• Espacamento dos parafusos:

$$A = \frac{\pi \phi^2}{4} = \frac{\pi 0,3^2}{4} = 0,0707 \text{ cm}^2$$

$$q \cdot a = \bar{\sigma}_{\text{par}} A_{\text{par}} \Rightarrow 0,135 a = 5 \times (2 \times 0,0707) \Rightarrow a = 2,09 a = 5,24 \text{ cm}$$

Em um trecho de 50 cm podemos colocar a = 5,0 cm $\rightarrow n = 3 \times 20 = 60$
total de 60 parafusos.

• Espessura da solda:

$$q \cdot a = \bar{\sigma}_{\text{solda}} (2 \times \frac{t}{\sqrt{2}}) \cdot a \Rightarrow 0,135 a = 6\sqrt{2} t \Rightarrow t = 1,59 \times 10^{-2} \text{ cm}$$

Seria melhor especificar pontos ou cordões de solda pois $t \ll e = 1 \text{ mm}$.



$$I_y: I_{\square} = 2 \left[2ea \times \left(\frac{a}{2}\right)^2 + \frac{ea^3}{12} \right] = \frac{7}{6} ea^3$$

$$I_y = 2 \left[I_{\square} + 6ea \times \left[\frac{3}{2}a\right]^2 + \frac{e(4a)^3}{12} \right] = 2ea^3 \left[\frac{7}{6} + \frac{54}{4} + \frac{64}{12} \right] = 40ea^3$$

$$I_z = 2 \left[8ea \times a^2 + \frac{2e(2a)^3}{12} - 2ea \times a \right] = 2ea^3 \left[8 + \frac{4}{3} - 2 \right] = \frac{44}{3} ea^3$$