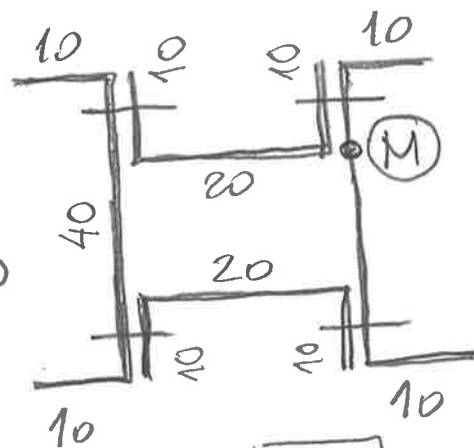
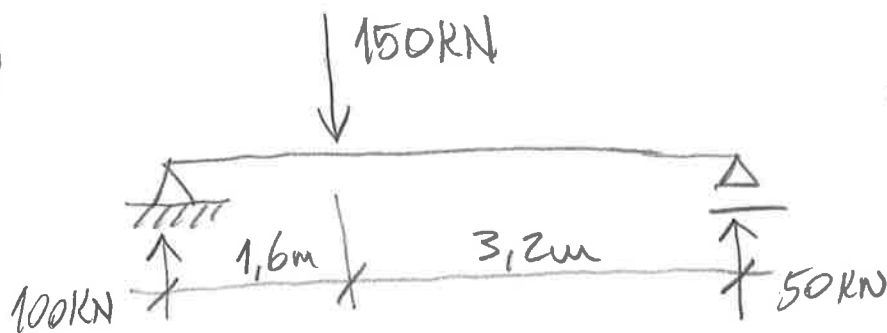


3)



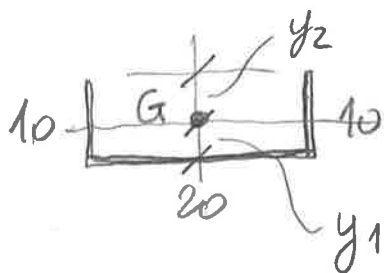
Determinar espaçamento entre parafusos e calcular tensão $\bar{C}$ no ponto (M) da ST ($t = 0,5 \text{ cm} = \text{cte}$).

ST
(cm)

$$A_{\text{par}} = 0,5 \text{ cm}^2$$

$$\bar{C}_{\text{par}} = 7,5 \text{ kN/cm}^2$$

a) Características geométricas



$$\begin{cases} y_1 = \frac{2 \times 10 \times 0,5 \times 5}{40 \times 0,5} = 2,5 \text{ cm} \\ y_2 = 7,5 \text{ cm} / I_{g_1} = 208,33 \text{ cm}^4 \end{cases}$$

$$I = 4 \times (10 \times 0,5) \times 20^2 + 2 \times 0,5 \times \frac{40^3}{12} + 2 \times 208,33 + 2 \times 20 \times 12,5^2$$

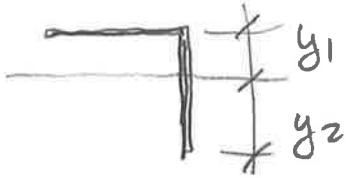
$$I = 20.000 \text{ cm}^4$$

$$q = \frac{V \bar{S}}{I} = \frac{100 \times (20 \times 12,5)}{20000} = 1,25 \text{ kN/cm}$$

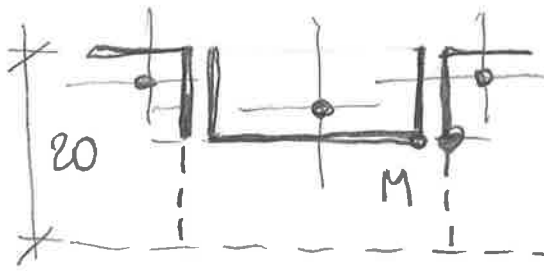
$$\frac{2(\bar{C} A)_{\text{par}}}{s} = q \quad \therefore \frac{2 \times 7,5 \times 0,5}{s} = 1,25$$

$$s = 6 \text{ cm} \quad \text{e} \quad p/V = 50 \text{ kN} \quad s = 12 \text{ cm}$$

b)



$$\begin{cases} y_1 = \frac{10 \times 0,5 \times 5}{10} = 2,5 \text{ cm} \\ y_2 = 7,5 \text{ cm} \end{cases}$$



$$\begin{cases} \bar{A} = 2 \times 10 + 20 = 40 \text{ cm}^2 \\ \bar{S} = 2 \times 10 \times 17,5 + 20 \times 12,5 \\ \bar{S} = 600 \text{ cm}^3 \end{cases}$$

$$\sigma^M = \frac{100 \times 600}{20.000 \times (2 \times 0,5)} = \boxed{3,0 \text{ kN/cm}^2}$$