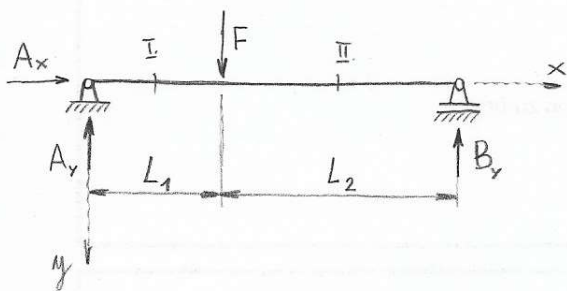


Dimenzionirajte nosilec nad podporo ter na največjo upogibno napetost.



$$A_x = 0$$

$$A_y + B_y - F = 0$$

$$FL_1 - B_y \cdot (L_1 + L_2) = 0$$

$$B_y = F \frac{L_1}{L_1 + L_2} = 4 \text{ kN}$$

$$A_y = F \frac{L_2}{L_1 + L_2} = 8 \text{ kN}$$

$$F = 12 \text{ kN}$$

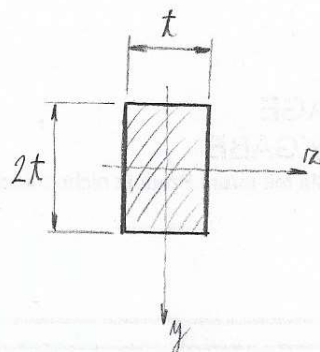
$$L_1 = 0,5 \text{ m}$$

$$L_2 = 1 \text{ m}$$

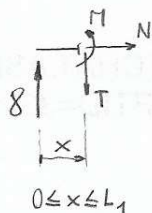
$$\tau_{DOP} = 90 \text{ MPa}$$

$$\sigma_{DOP} = 160 \text{ MPa}$$

$$t = ?$$



I. polje



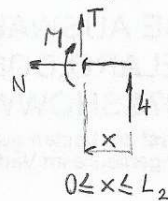
$$N = 0$$

$$T = 8 \text{ kN}$$

$$M = 8 \cdot x$$

$$M_{\max}^I = 8 \cdot 0,5 = 4 \text{ kNm}$$

II. polje



$$N = 0$$

$$T = -4 \text{ kN}$$

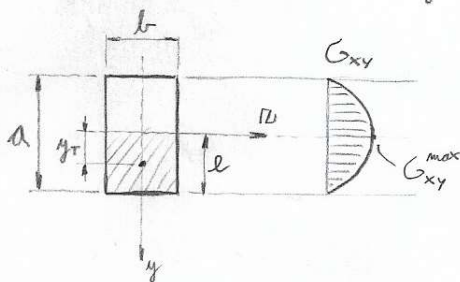
$$M = 4 \cdot x$$

$$M_{\max}^{II} = 4 \cdot 1 = 4 \text{ kNm}$$

nad podporo A je v nosilec največja strizna sila, matr. up. moment je pa enak nič:

$$\left. \begin{array}{l} T_{\max} = 8 \text{ kN} \\ M = 0 \end{array} \right\} \Rightarrow \text{dimenzioniramo na strig}$$

$$\tau_{xy}(y) = \frac{T \cdot S_{yz}(y)}{b(y) \cdot J_z} \leq \tau_{DOP}$$



$$S_{yz}(y=0) = y_T \cdot A_{yz} = \frac{a}{4} \cdot \frac{a}{2} \cdot b = \frac{a^2 b}{8} = \frac{(2t)^2 \cdot t}{8}$$

$$S_{yz}(y=0) = \frac{1}{2} t^3 = S_{yz}^{\max}$$

$$G_{xy}^{\max} = \frac{T_{\max} \cdot S_{yz}^{\max}}{t \cdot J_z} = \frac{8000 \cdot t^3 \cdot 3}{2 \cdot t \cdot 2t^4} \leq \tau_{DOP} \Rightarrow \frac{6000}{t^2} \leq 90$$

$$t \geq 8,165 \text{ mm}$$

$$J_z = \frac{b a^3}{12} = \frac{t (2t)^3}{12} = \frac{2t^4}{3}$$

dimenzioniranje na največjo upogibno napetost (pod silo F). Strizna napetost je tam enaka nič!

$$\sigma_{xx}^{\max} = \frac{M_{\max}}{J_z} y_{\max} \leq \sigma_{DOP}$$

$$\frac{4 \cdot 1000^2 \cdot 3}{2 t^4} \cdot t \leq 160$$

$$\frac{6000000}{t^3} \leq 160$$

$$t \geq \sqrt[3]{\frac{6000000}{160}}$$

$$t \geq 33,472 \text{ mm}$$

⇓
upogib je veliko bolj nevaren kot strig!