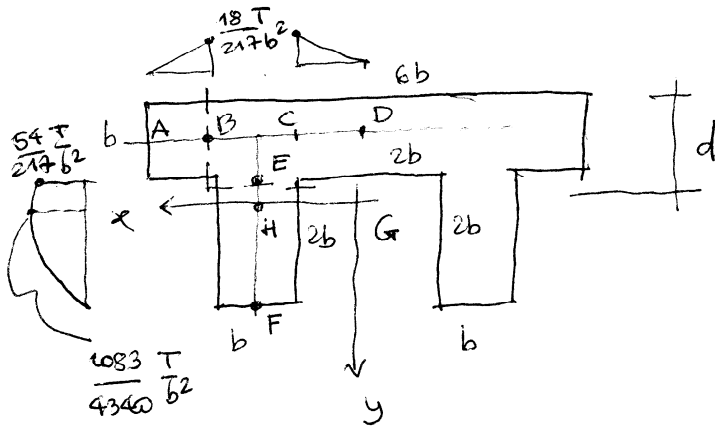


Problema 1



$$d = \frac{6b^2 \cdot \frac{b}{2} + 2 \cdot 2b^2 \cdot 2b}{6b^2 + 4b^2} = \frac{11}{10} b$$

$$J_x = \frac{1}{12} \cdot 6b \cdot b^3 + 6b^2 \left( \frac{11}{10}b - \frac{b}{2} \right)^2 + 2 \cdot \frac{1}{12} b (2b)^3 + 2 \cdot 2b^2 \left( 2b - \frac{11}{10}b \right)^2 =$$

$$= \frac{b^4}{2} + 6 \cdot \frac{9}{25} b^4 + \frac{4}{3} b^4 + \frac{81}{25} b^4 = \left( \frac{11}{6} + \frac{135}{25} \right) b^4 = \left( \frac{11}{6} + \frac{27}{5} \right) b^4 = \frac{217}{30} b^4$$

$$\sigma_{zx}(B) = \frac{T_y b^2 \left( \frac{11}{10}b - \frac{b}{2} \right)}{b \cdot \frac{217}{30} b^4} = - \frac{30 T_y}{217 b^3} \cdot \frac{3}{5} b = - \frac{18}{217} \cdot \frac{T_y}{b^2} \approx 0,08 \frac{T_y}{b^2}$$

$$\text{nao EF} : \sigma_{zy} = \frac{T_y b \left( \frac{19}{10}b - y \right) \cdot \frac{1}{2} \left( \frac{19}{10}b + y \right)}{b \cdot \frac{217}{30} b^4} = \frac{30 T_y}{217 b^4} \cdot \frac{1}{2} \left( \frac{361}{100} b^2 - y^2 \right) =$$

$$= \frac{15 T_y}{217 b^4} \left( \frac{361}{100} b^2 - y^2 \right)$$

$$\sigma_{zy}(E) = \frac{15 T_y}{217 b^4} \left( \frac{361}{100} b^2 - \frac{b^2}{100} \right) = \frac{15}{217} \cdot \frac{360}{100} \frac{T_y}{b^2} = \frac{54}{217} \cdot \frac{T_y}{b^2} \approx 0,25 \frac{T_y}{b^2}$$

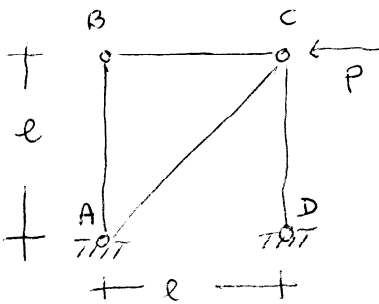
$$\sigma_{zy}(H) = \frac{15 T_y}{217 b^4} \cdot \frac{361}{100} b^2 = \frac{3}{20} \cdot \frac{361}{217} \frac{T_y}{b^2} = \frac{1083}{4340} \frac{T_y}{b^2} \approx 0,25 \frac{T_y}{b^2}$$

$$\sigma_z = \frac{My}{\frac{217b^4}{30}} = \frac{30}{217} \cdot \frac{My}{b^4} = \frac{30}{217} \frac{T_y}{b^3} y$$

$$\sigma_{id} = \sqrt{\sigma_z^2 + 3\tau_{zy}^2} =$$

$$= \frac{15}{217} \frac{T_y}{b^3} \sqrt{36y^2 + \frac{3}{b^2} \left( \frac{361}{100} b^2 - y^2 \right)^2}$$

Problema 2



Nella configurazione fond. le  $N_{AC} = -P\sqrt{2}$ .

Valore critico del carico:

$$P_{cr} \sqrt{2} = \frac{\pi^2 EJ}{2l^2} \Rightarrow P_{cr} = \frac{\pi^2 EJ}{2l^2 \sqrt{2}}$$