DOM SEG TER QUA QUI SEX SÁB

08 05 19

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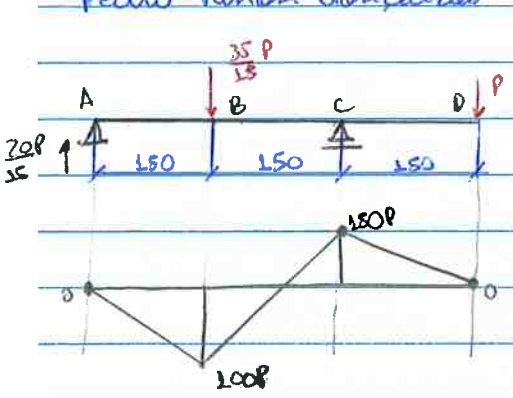
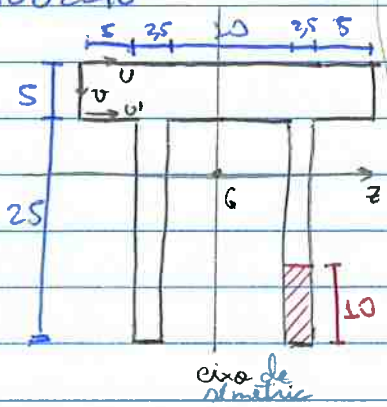
$N^x = \frac{M S_z^x}{I_z}$





a) Determinar Pmax

$\sigma_{d,t} = 1 KN/cm^2$

$\sigma_{d,c} = 3 KN/cm^2$

b) Com esse P, a resultante das tensões normais na região fachurada.
↳ Na seção E

↳ $y_G = 12,5 cm$

a)

$y_G = \frac{S_u}{A} = \frac{2,5 \cdot 5 \cdot 25 + 2(17,5 \cdot 2,5 \cdot 25)}{5 \cdot 25 + 2,5 \cdot 25 \cdot 2} = 10 cm$

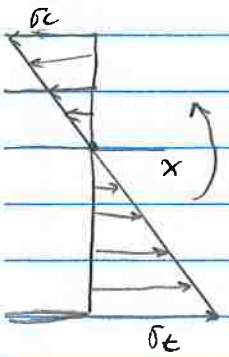
$I_{U'} = \frac{25 \cdot 5^3}{3} + 2 \cdot \frac{2,5 \cdot 25^3}{3} = 27083,3 cm^4$

$I_z = I_{U'} - S^2 \cdot A = 20833 cm^4$

$W_{z,i} = \frac{I_z}{y_i} = \frac{20833}{20} = 1042 cm^3$

$W_{z,s} = \frac{I_z}{y_s} = \frac{20833}{10} = 2083 cm^3$

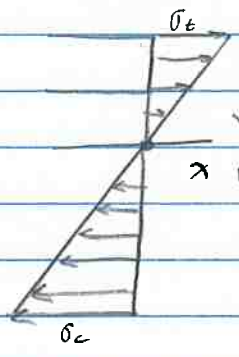
Seção B:



$\sigma_c = \frac{M_y}{W_{z,s}} = \frac{100P}{2083}$

$\sigma_t = \frac{M_y}{W_{z,i}} = \frac{100P}{1042}$

Seção C:



$\sigma_t = \frac{M_y}{W_{z,s}} = \frac{150P}{2083}$

$\sigma_c = \frac{M_y}{W_{z,i}} = \frac{150P}{1042}$

Tração máx: $\frac{100P}{1042} = 1 \Rightarrow P^t_{máx} = 10,42 KN$

Compressão máx: $\frac{150P}{1042} = 3 \Rightarrow P^c_{máx} = 20,84 KN$

$P_{máx} = 10,42 KN$

b) $N^x = \frac{M_y^0 \cdot S_z^x}{I_z} = \frac{(150 \cdot 10,42)(15 \cdot 10 \cdot 2,5)}{20833} = 28,13 KN$