

Examen Final de Elasticidad y Resistencia de Materiales 27/9/201
Problema de Resistencia (2º Parcial)

$$V_B = H_B = H_A; V_B \cdot 7 + H_B \left(\frac{3}{\sqrt{3}} + 4 \right) = 20(4\sqrt{2} \cdot 5 + 2\sqrt{3} \cdot 1,5) \rightarrow \underline{V_B = H_B = H_A = 52,59}$$

$$\underline{R_B = 74,37 \text{ KN}}; V_A = 20(4\sqrt{2} + 2\sqrt{3}) - 52,59 \rightarrow \underline{V_A = 129,83 \text{ KN}}$$

$$\underline{N_B = 0}; N_A = -129,83 \cdot 0,5 - 52,59 \frac{\sqrt{3}}{2} \rightarrow \underline{N_A = -110,46}; N_{C,B} = 20 \cdot 4\sqrt{2} \frac{\sqrt{2}}{2}$$

$$\underline{N_{C,B} = -80 \text{ KN}}; N_{C,A} = -110,46 + 20 \cdot 2\sqrt{3} \frac{1}{2} \rightarrow \underline{N_{C,A} = -75,82 \text{ KN}}$$

$$\underline{C_B = -74,37}; C_A = 129,83 \frac{\sqrt{3}}{2} - 52,59 \frac{1}{2} \rightarrow \underline{C_A = 86,14 \text{ KN}}; C_{C,B} = 80 - 74,37 =$$

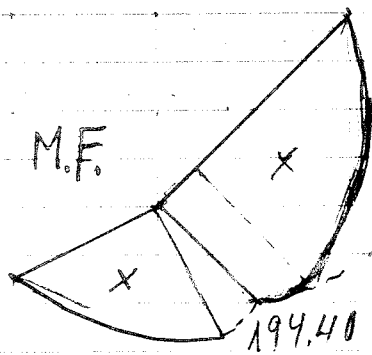
$$\underline{C_{C,B} = 5,63 \text{ KN}}; C_{C,A} = 86,14 - 20 \cdot 2\sqrt{3} \frac{\sqrt{3}}{2} \rightarrow \underline{C_{C,A} = 26,14 \text{ KN}}$$

$$M_A = 0; M_B = 0; M_C = 74,37 \cdot 5,66 - 20 \frac{\sqrt{2}}{2} \frac{5,66^2}{2} \rightarrow \underline{M_C = 194,40 \text{ KNm}}$$

$$\text{para } C = 0 \rightarrow \frac{74,37}{5,63} = \frac{4\sqrt{2} - x}{x} \rightarrow \underline{x = 0,40}; \underline{M_T = 0}$$

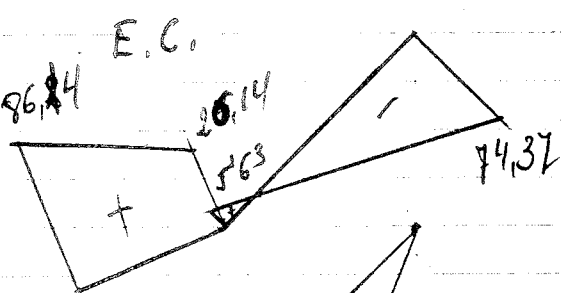
$$M_{\max} = 74,37 \cdot 5,26 - 20 \frac{\sqrt{2}}{2} \cdot \frac{5,26^2}{2} \rightarrow \underline{M_{\max} = 195,56 \text{ KNm}}$$

$$W \approx \frac{195,56 \times 10^5}{170 \times 10^2} = \underline{1151 \text{ cm}^3} \approx W_2 \text{ Tanto}$$



$$\text{I.P.N.-380, } W = 1.260 \text{ cm}^3; A = 107 \text{ cm}^2$$

$$\left(\frac{195,56 \times 10^2}{1.260 \times} + \frac{110,46}{107 \times} \right) 10 = \underline{165,5 \text{ MPa}} < 170$$



$$V'_B = H'_B = H'_A; V'_B \cdot 7 + H'_B \left(\frac{3}{\sqrt{3}} + 4 \right) = 1,3 \rightarrow$$

$$\Rightarrow V'_B = H'_B = H'_A = 0,2356; V'_A = 1 - 0,2356 = 0,7644$$

$$R'_B = 0,3332; C'_A = 0,7644 \frac{\sqrt{3}}{2} - 0,2356 \cdot \frac{1}{2} = 0,5442$$

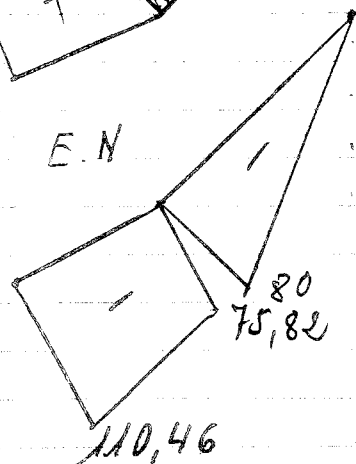
$$C'_B = 0,3332;$$

$$M'_{R_1} = 86,14 \cdot s_1 - 20 s_1 \frac{s_1 \sqrt{3}}{2} \quad 0 \leq s_1 \leq 3,464$$

$$M'_{V_1} = 0,5442 s_1, \quad 0 \leq s_1 \leq 3,464$$

$$M'_{R_2} = 74,37 \cdot s_2 - 20 s_2 \frac{s_2 \sqrt{2}}{2} \quad 0 \leq s_2 \leq 5,66$$

$$M'_{V_2} = 0,3332 s_2 \quad 0 \leq s_2 \leq 5,66$$



$$M.T. \equiv 0$$

$$10^3 \delta = \frac{10^6}{2 \times 10^5 \times 10^6 \cdot 24010 \times 10^8} \left[\int_0^{3,464} (46,88 s_1^2 - 4,715 s_1^3) ds_1 + \int_0^{5,66} (24,78 s_2^2 - 2,356 s_2^3) ds_2 \right]$$