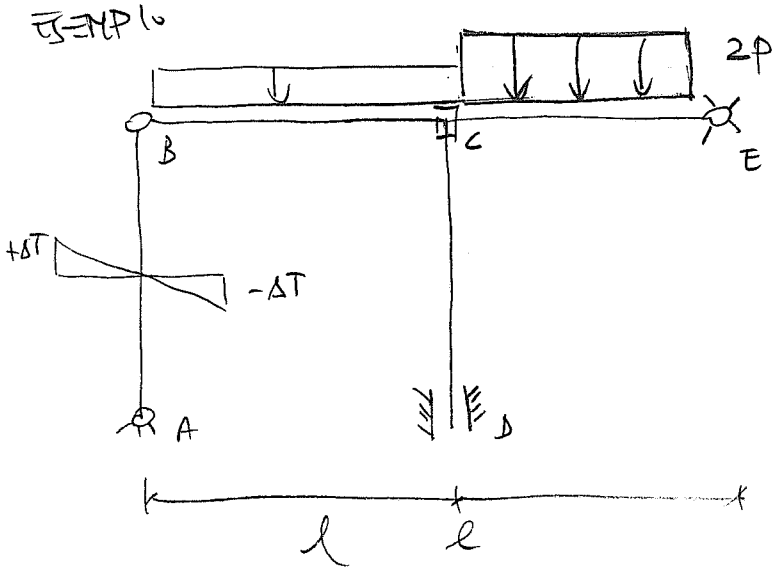
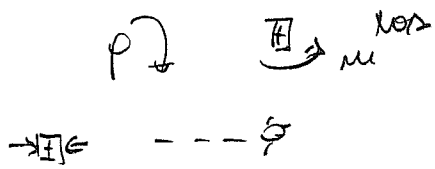
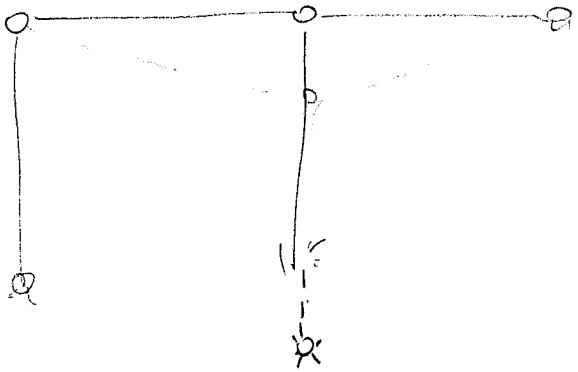
ESEMPIO



$\frac{\alpha \Delta T}{h} = \frac{p\ell^2}{2EJ}$

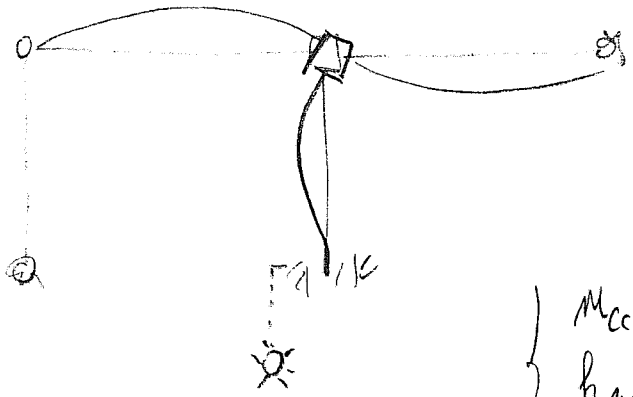


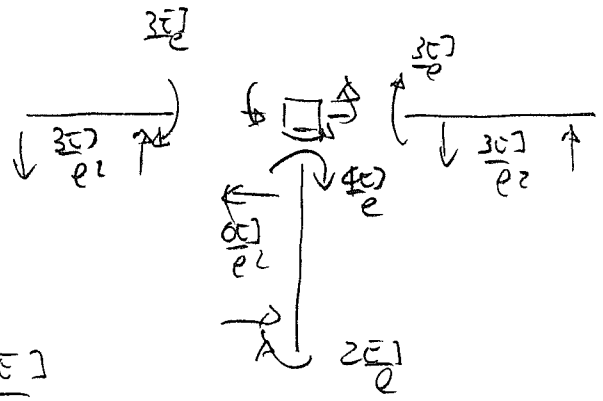


NODI SPOSTABILI

$$\begin{cases} M_{cc}\phi_c + M_{c\eta}\eta + M_{c\phi} = 0 \\ h_{\eta c}\phi_c + h_{\eta\eta}\eta + h_{\eta\phi} = 0 \end{cases}$$

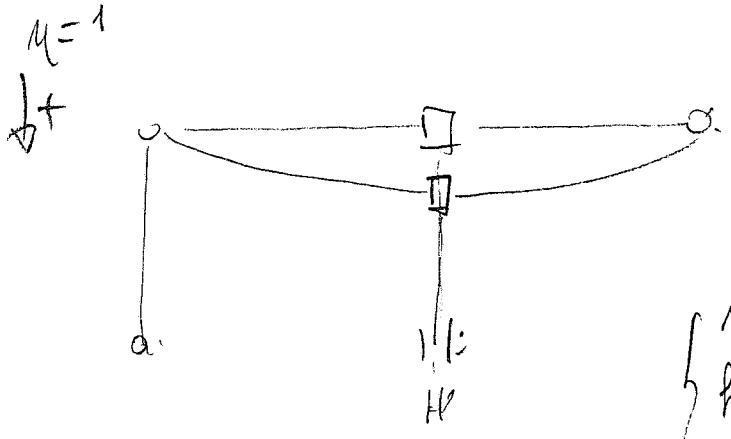
$\phi_c = 1$

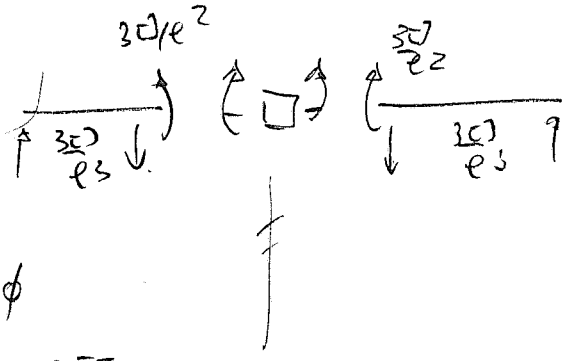




$$\begin{cases} M_{cc} = \frac{10EJ}{\ell} \\ h_{\eta c} = \phi\left(\frac{3EJ}{\ell^2} - \frac{3EJ}{\ell^2}\right) \end{cases}$$

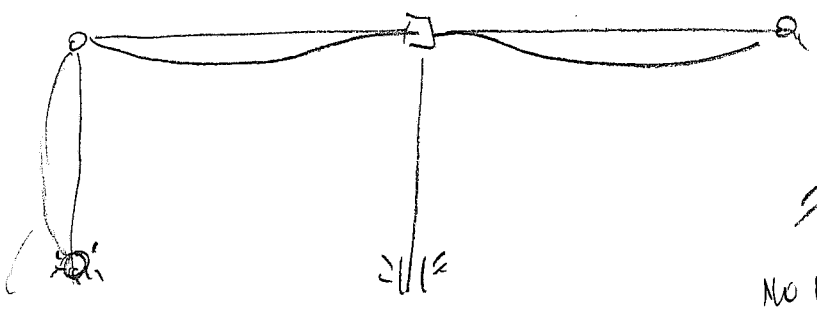
$\eta = 1$





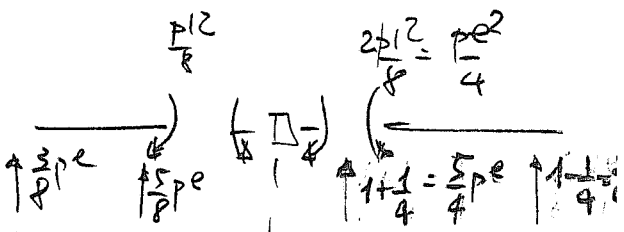
$$\begin{cases} M_{c\eta} = \phi \\ h_{\eta\eta} = -\frac{6EJ}{\ell^3} \end{cases}$$

$p \neq \phi \quad \Delta T \neq \phi$



$\neq$

NO MOMENT IN STRUCTURE ISOSTATICA $\Rightarrow$ CAUSA SOLO DEFORMAZ.



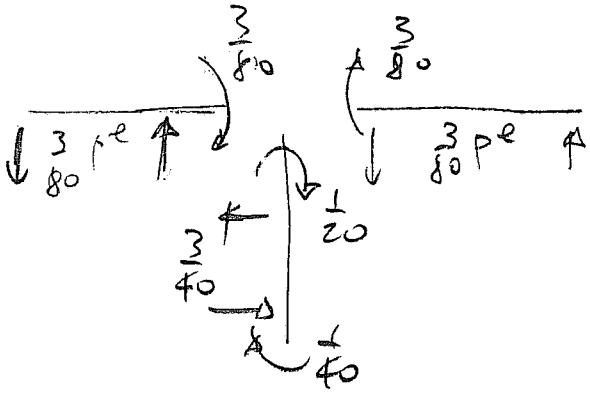
$\neq$

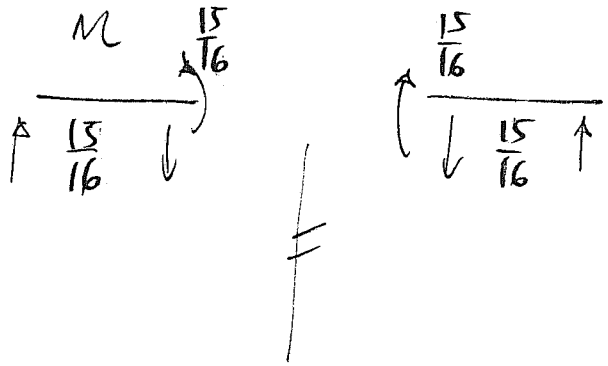
$$\begin{cases} M_C \phi = \frac{pl^2}{8} - \frac{pl^2}{4} = -\frac{pl^2}{8} \\ h_\eta \phi = \frac{5}{8} pe + \frac{5}{4} pe = \frac{15}{8} pe \end{cases}$$

$$\begin{cases} \frac{10EJ}{e} \phi_C + \phi - \frac{pl^2}{8} = -\phi \\ \phi - \frac{6EJ}{e^3} \eta + \frac{15}{8} pe = -\phi \end{cases}$$

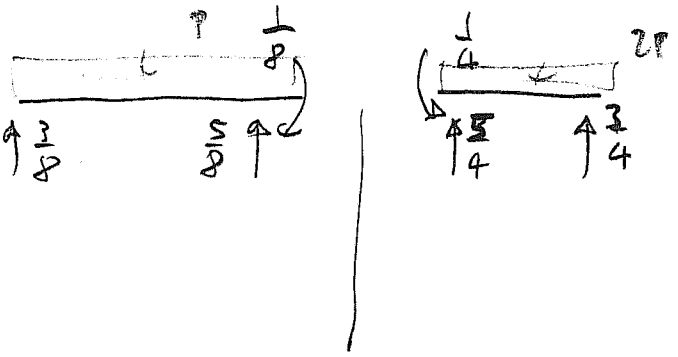
$$\begin{cases} \phi_C = \frac{1}{80} \frac{pl^3}{EJ} \\ \eta = \frac{5}{16} \frac{pe^4}{EJ} \end{cases}$$

ϕ

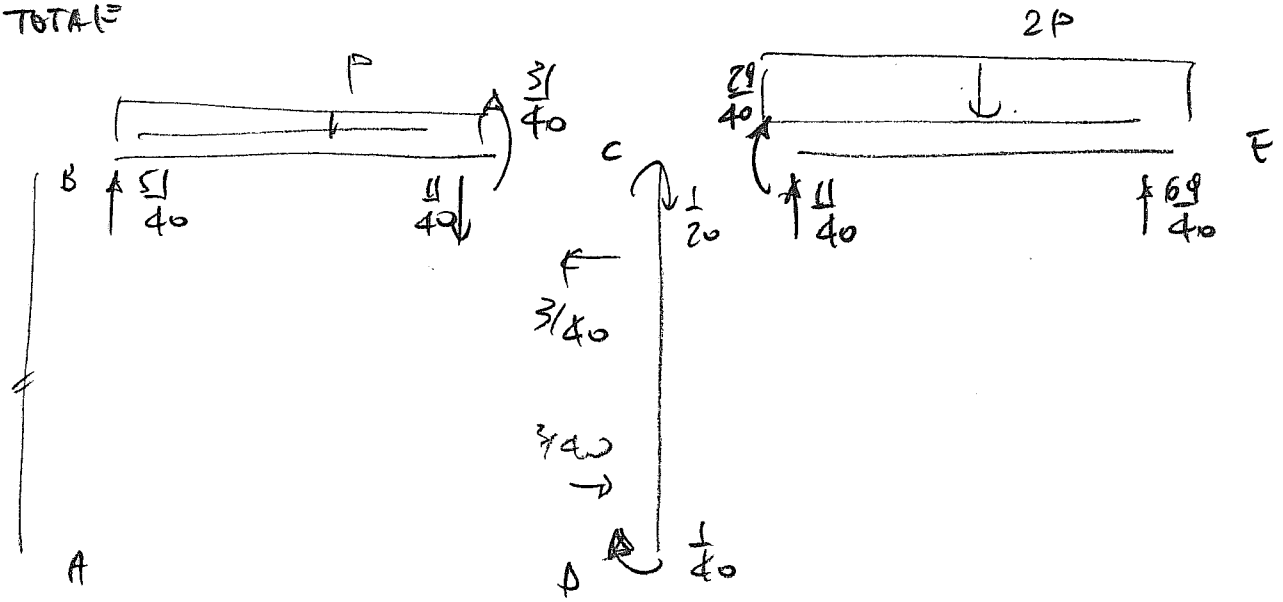




$\neq$



TOTALE



$M_{BC} = \frac{31}{40} pLx - p\frac{x^2}{2}$ *

$V_{BC} = \frac{31}{40} pL - px = 0$ mai

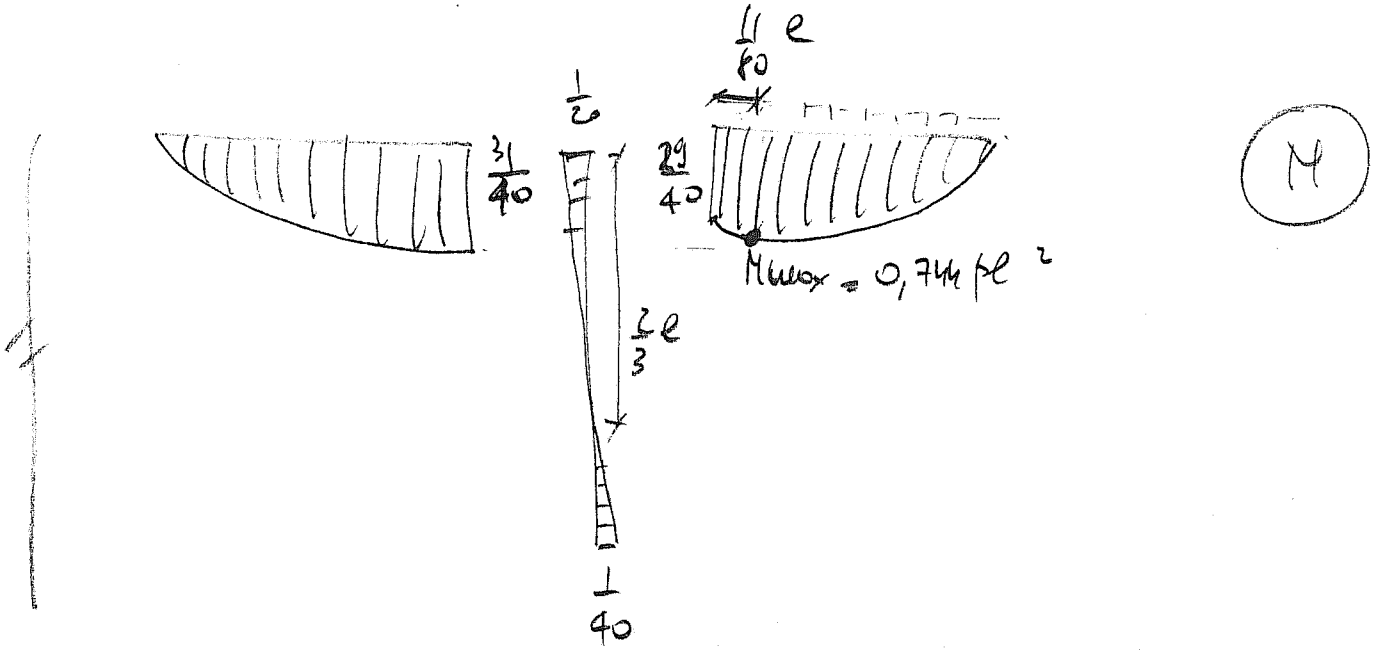
M_{BC} so sempre

$M_{CE} = \frac{29}{40} pL^2 + \frac{11}{40} pLx - 2p\frac{x^2}{2}$

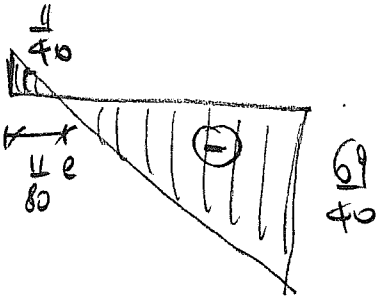
$V_{CE} = \frac{11}{40} pL - 2px = 0$ $V_{CE} = 0$ per $2x = \frac{11}{40} L$ $x = \frac{11}{80} L$

$M_{CE,max} = \left(\frac{29}{40} + \frac{11}{40}\cdot\frac{11}{80} - \left(\frac{11}{80}\right)^2\right) pL^2 = \frac{4761}{6400} pL^2 = 0{,}744\, pL^2$

$> \frac{29}{40}$

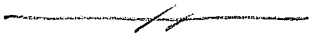


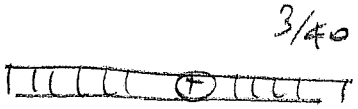
(V)



↑H↓

(N)



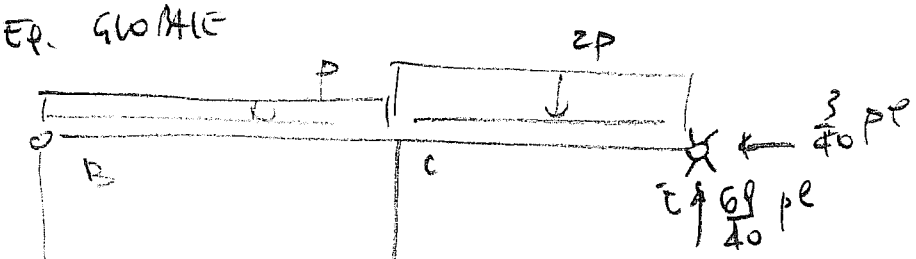


→H←

COME DEVE ESSERE.

Eq. NODO ok

Eq. GLOBALE



GLI EQUILIBRI GLOBALI CONFERMANO LA BONTÀ NELL'AFFIDAMENTO DEL TAGLIO IN D CHE SU CE

$\sum F_H = 0$

$\sum F_V = 3p\ell - \frac{69}{40}p\ell - \frac{51}{40}p\ell = 0$

$\curvearrowleft \sum M_E = p\ell\frac{3}{2}\ell + p\ell\frac{\ell}{2} - \frac{1}{40}p\ell^2 + \frac{3}{40}p\ell^2 - \frac{51}{40}p\ell\ell =$

$\frac{3}{2}p\ell^2 + p\ell^2 + \frac{1}{40}p\ell^2 - \frac{51}{40}p\ell^2 = 0$

DEFORMATA QUALITATIVA ASTA AB

$y'' = + \frac{2\alpha\Delta T}{h}$

$y'' = -\frac{M}{EJ} + \frac{2\alpha\Delta T}{h} = \frac{2\alpha\Delta T}{h} = 2 \cdot \frac{pl^2}{2EJ} = \frac{pl^2}{EJ}$

$y'' > 0$ SEMPRE