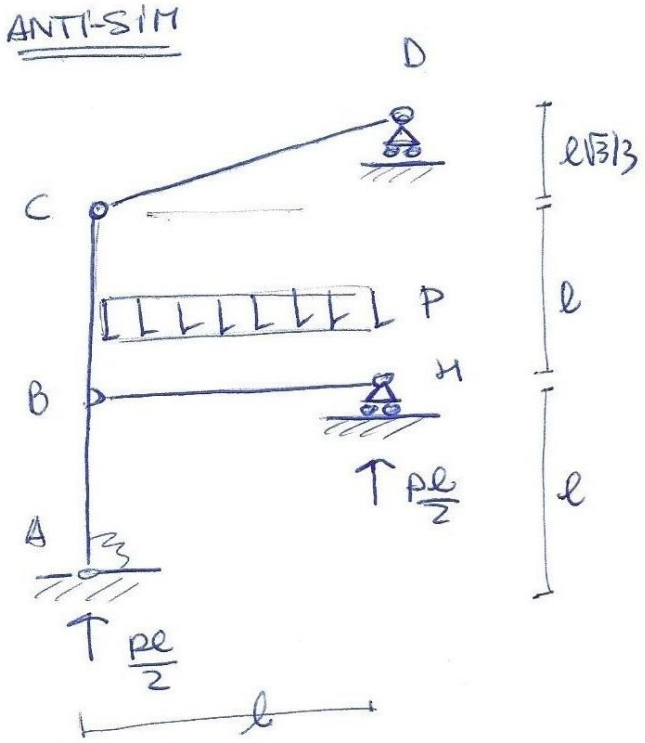
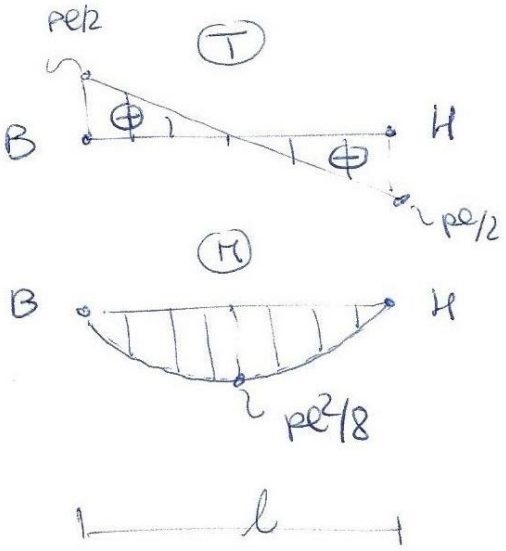
Università di Pisa
Esame di SCIENZA DELLE COSTRUZIONI I
Corso di Laurea in Ingegneria Civile, Ambientale e Edile

(Docente: Prof. Ing. Stefano Bennati)

Prova Scritta del 12 Gennaio 2019 – Sintesi Soluzione





$$N_{AB} = -\frac{P\ell}{2}$$

$$T_{BH} = \frac{P\ell}{2} - PS$$

$$M_{BH} = P\frac{\ell}{2}S - P\frac{S^2}{2}$$

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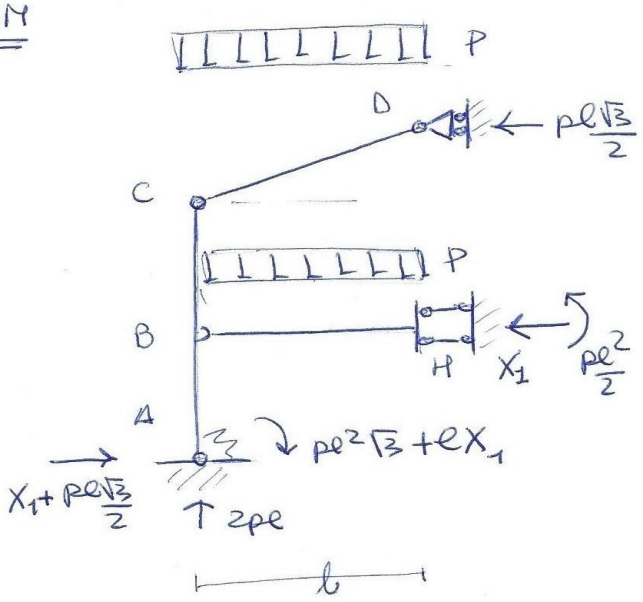
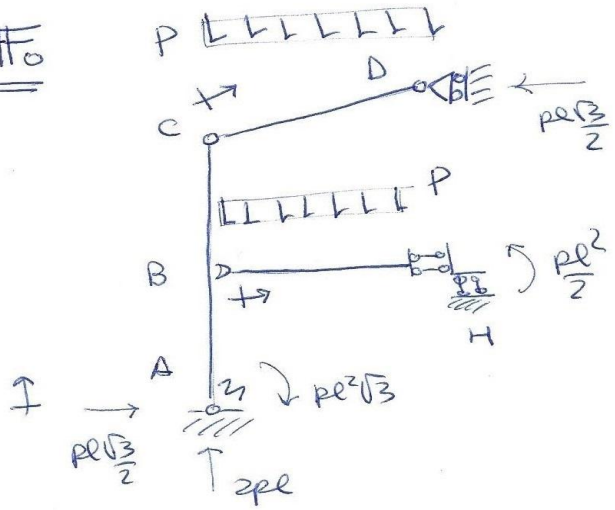
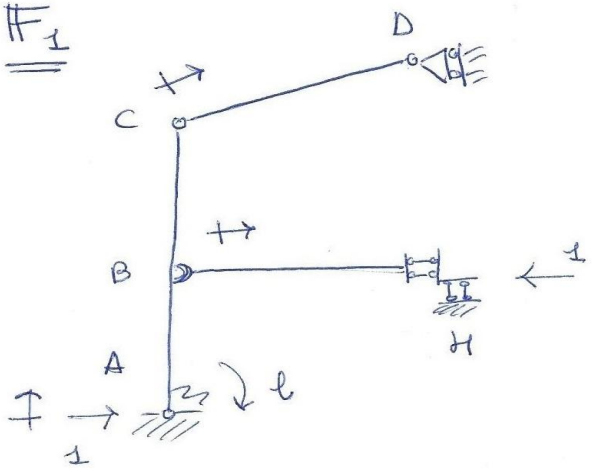
SIM



F_0



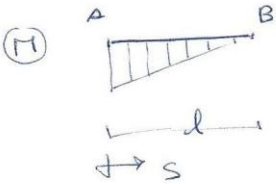
F_1



F_1

$N_{BH} = -1$

$T_{AB} = -1$



$M_{AB} = \ell - S$

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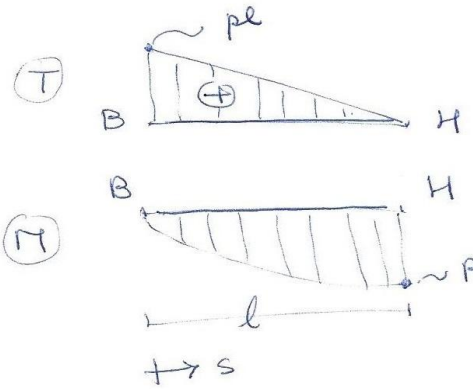
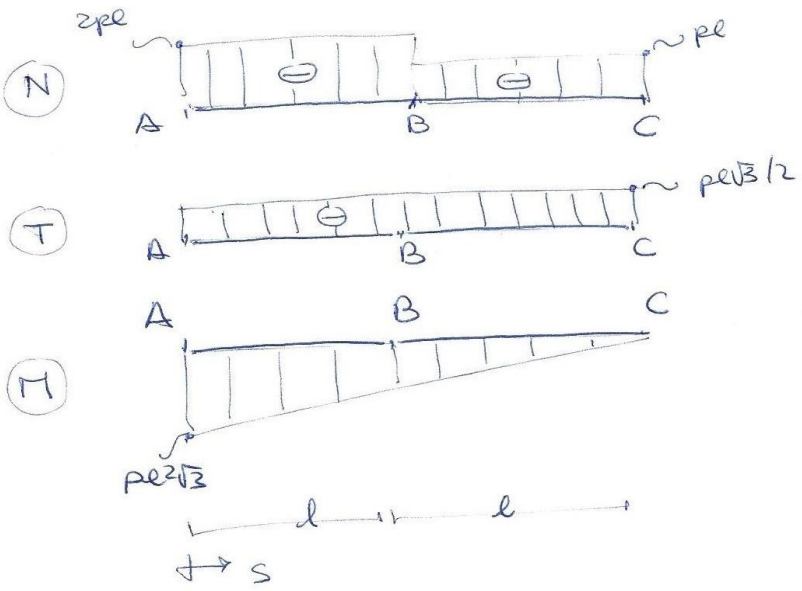
F_0



$T_{BH} = p\ell - pS$

$M_{BH} = p\ell S - p\frac{S^2}{2}$

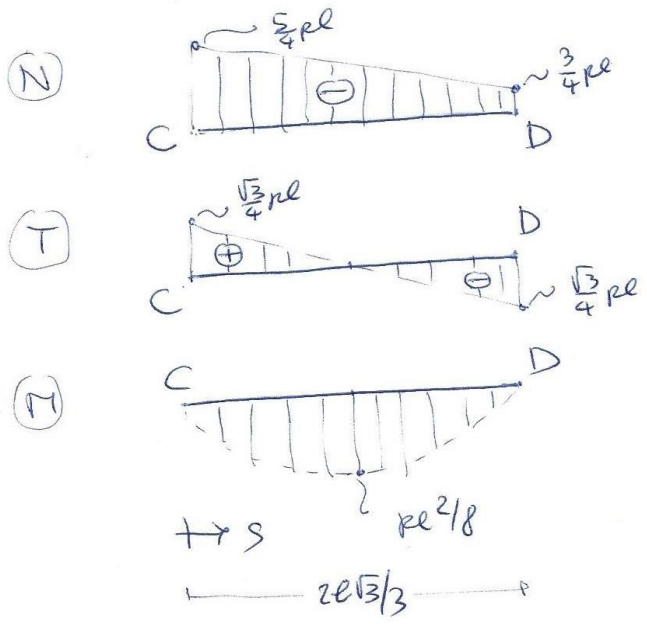


$N_{AB} = -2p\ell$

$N_{BC} = -p\ell$

$T_{ABC} = -p\ell\sqrt{3}/2$

$M_{ABC} = p\ell^2\sqrt{3} - p\ell\frac{\sqrt{3}}{2}S$



$N_{CD} = -\frac{5}{4}p\ell + \frac{\sqrt{3}}{4}pS$

$T_{CD} = \frac{\sqrt{3}}{4}p\ell - \frac{3}{4}pS$

$M_{CD} = \frac{\sqrt{3}}{4}p\ell S - \frac{3}{8}pS^2$

$\eta_1 = \eta_{10} + X_1 \cdot \eta_{11}$ con $\eta_1 = 0$ **13**

$$1 \cdot \eta_{11} - \frac{\ell^2}{k_0} = \int_{BH} \frac{N_1^2}{EA} + \int_{AB} \frac{M_1^2}{EJ} = \dots \qquad \eta_{11} = \frac{\ell^2}{k_0} + \frac{\ell^3}{3EJ} + \frac{\ell}{EA}$$

$$1 \cdot \eta_{10} - \ell \cdot \frac{p\ell^2\sqrt{3}}{k_0} = \int_{AB} M_1 \chi_0 = \dots \qquad \eta_{10} = \sqrt{3}\,\frac{p\ell^3}{k_0} + \frac{5\sqrt{3}}{12}\,\frac{p\ell^4}{EJ}$$

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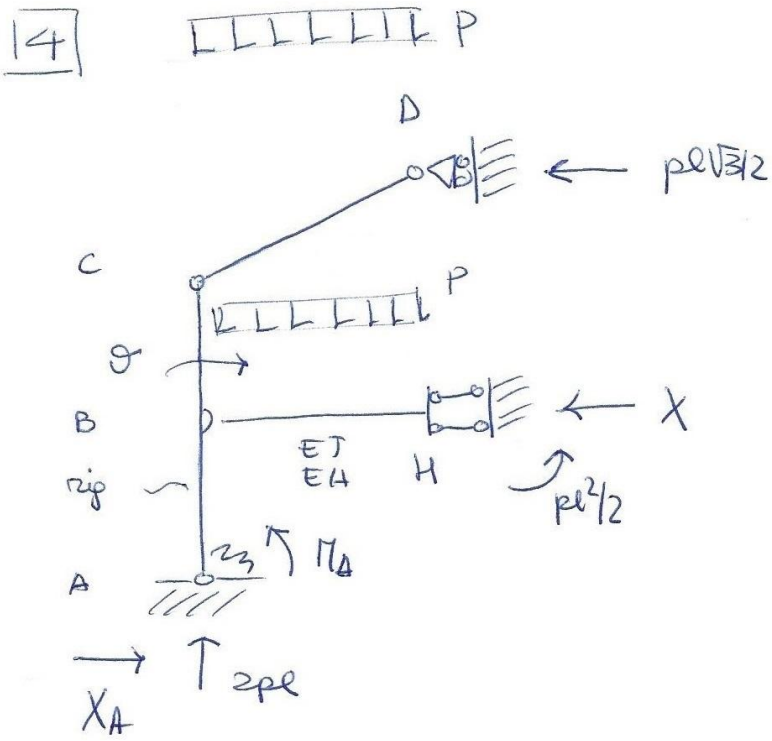

$\Delta\ell_{BH} = -\ell\vartheta$

$N_{BH} = -\dfrac{EA\ell\vartheta}{\ell}$

$\Rightarrow X = EA \cdot \vartheta$

$M_A = k_0\vartheta$

$X_A = p\ell\dfrac{\sqrt{3}}{2} + EA \cdot \vartheta$

Equilibrio Rot.: $\quad k_0\vartheta + EA\vartheta \cdot \ell + p\dfrac{\sqrt{3}}{2}\ell \cdot 2\ell = 0$

da cui: $\quad \vartheta = -\dfrac{p\sqrt{3}\ell^2}{k_0 + EA\ell}$