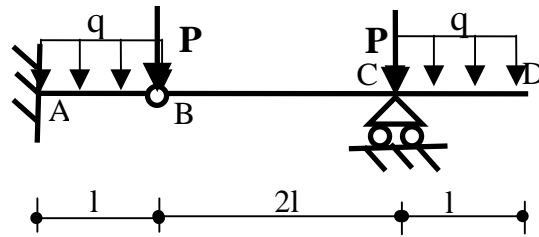
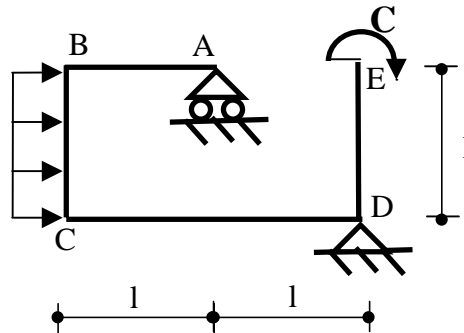


FERRARA, 3/11/2008

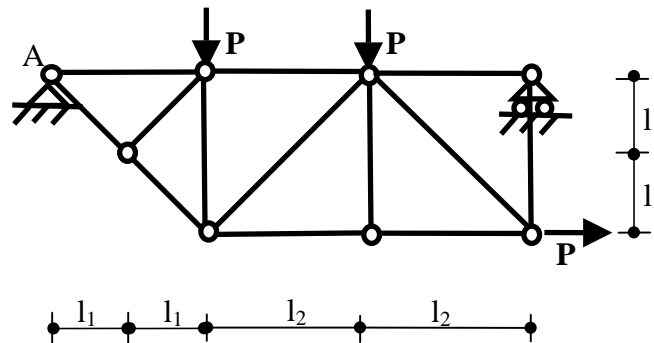
- 1) Disegnare i diagrammi quotati delle azioni interne (N, T, M) per $l=1\text{ m}$, $q=1500\text{ kg/m}$, $P=1.5\text{ t}$



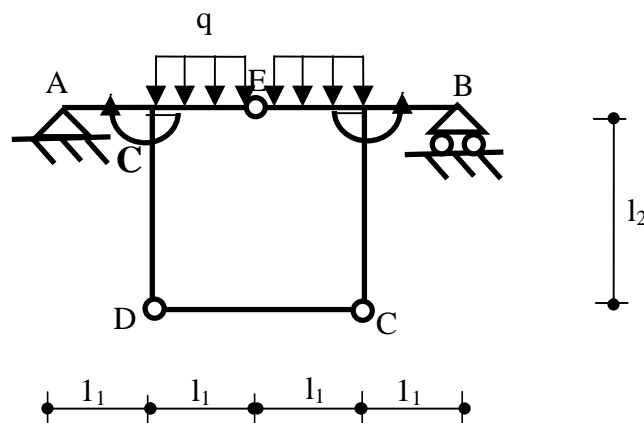
- 2) Disegnare i diagrammi quotati delle azioni interne (N, T, M) per $l=1\text{ m}$, $q=1500\text{ kg/m}$, $C=1.5\text{ tm}$.



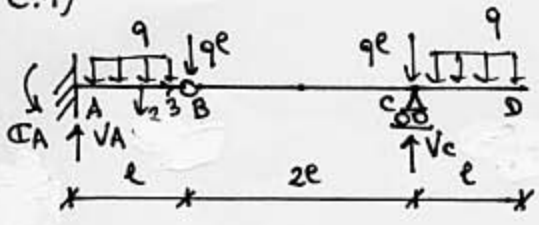
- 3) Calcolare lo stato di sollecitazione per $l_1=0.5\text{ m}$, $l_2=1\text{ m}$, $P=1.5\text{ t}$.



- 4) Disegnare i diagrammi quotati di (N,T,M) per $l_1=0.5\text{ m}$, $l_2=1\text{ m}$, $C=1.5\text{ tm}$, $q=1500\text{ kg/m}$.



C.1)



(B \uparrow)_{BCD} $V_c z l = ql \frac{5}{2} l + 2ql^2 = \frac{9}{2} ql^2$

$\hookrightarrow V_c = \frac{9}{4} ql = 3375 \text{ kg}$

(\uparrow) $V_A = 2ql + 2ql - \frac{9}{4} ql = \frac{7}{4} ql = 2625 \text{ kg}$

(B \uparrow)_{AB} $C_A = \frac{7}{4} ql^2 - ql^2 = \frac{3}{4} ql^2 = 1875 \text{ kgm}$

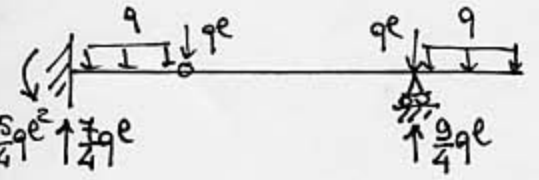
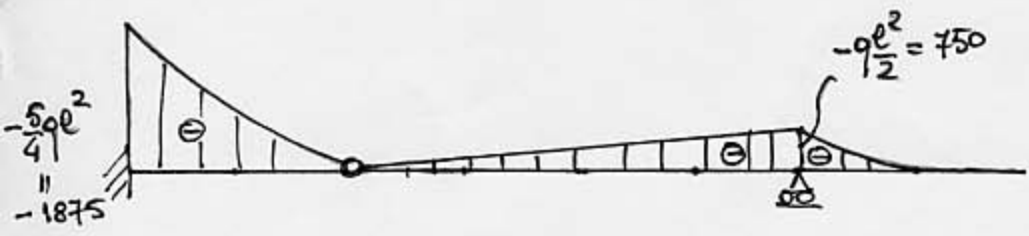
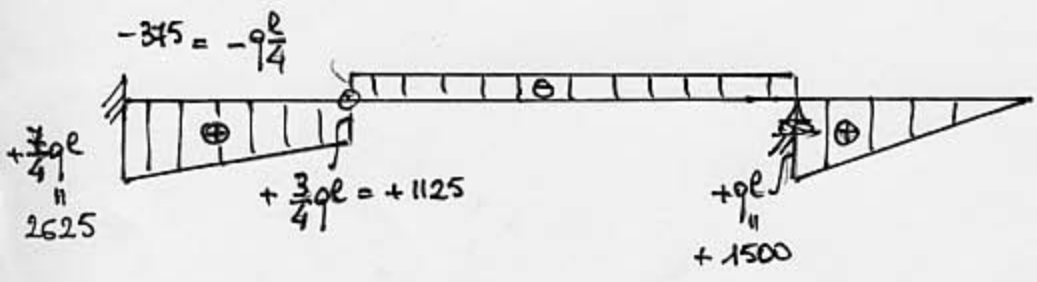


Diagramm:

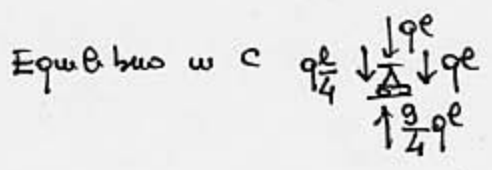
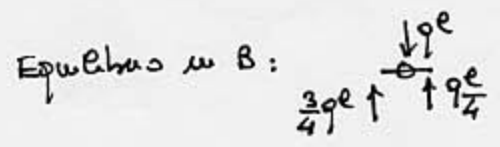


(M)
(kgm)

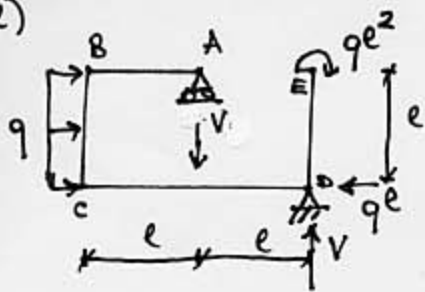


(N)
(kg)

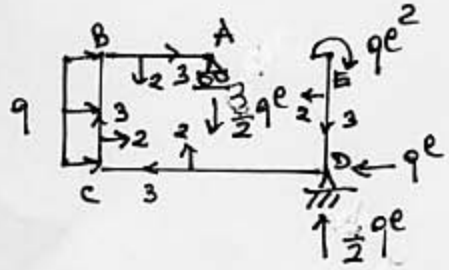
$N=0$



C.2)



$$(D) \quad ve = qe^2 + qe^2 = \frac{3}{2} qe^2 \rightarrow v = \frac{3}{2} qe = 2250 \text{ kg}$$



Equilibrium w A:

$$\frac{3}{2} qe \uparrow \quad \frac{3}{2} qe^2 \curvearrowright$$

Equilibrium of AB:

$$\frac{3}{2} qe^2 \curvearrowright \quad \frac{3}{2} qe \uparrow \quad \frac{3}{2} qe \downarrow$$

Equilibrium w B:

$$\frac{3}{2} qe^2 \curvearrowright \quad \frac{3}{2} qe \downarrow \quad \frac{3}{2} qe \uparrow \quad \frac{1}{2} qe \uparrow$$

Equilibrium of BC:

$$\frac{3}{2} qe \downarrow \quad \frac{3}{2} qe^2 \curvearrowright \quad \frac{3}{2} qe \downarrow \quad \frac{1}{2} qe \uparrow \quad (\frac{3}{2} + \frac{1}{2}) qe^2 = 2 qe^2$$

Equilibrium w C:

$$2 qe^2 \curvearrowright \quad \frac{3}{2} qe \downarrow \quad \frac{3}{2} qe \uparrow \quad \frac{1}{2} qe \uparrow \quad qe \leftarrow$$

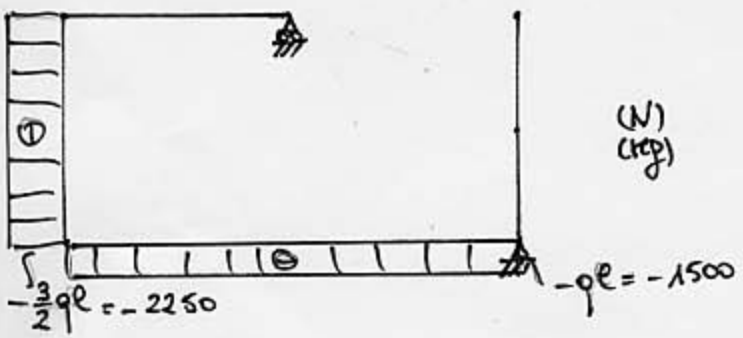
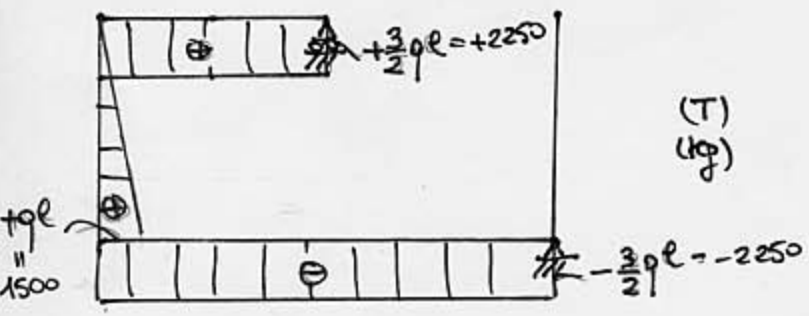
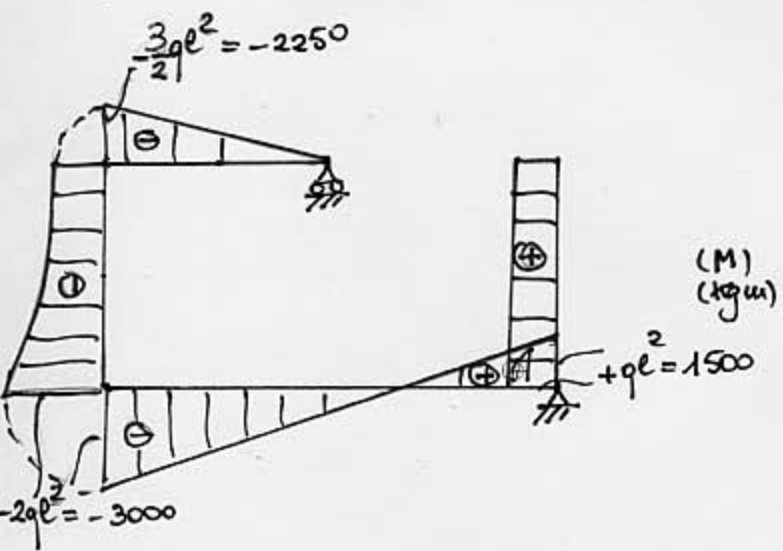
Equilibrium of CD:

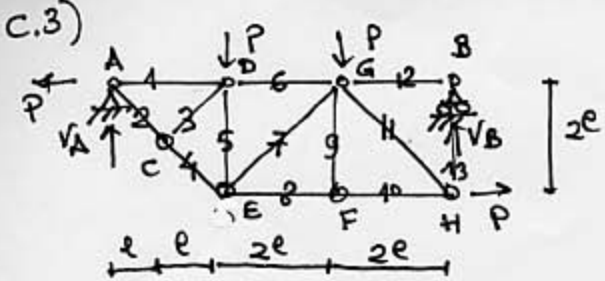
$$2 qe^2 \curvearrowright \quad qe \leftarrow \quad \frac{3}{2} qe \downarrow \quad \frac{3}{2} qe \uparrow \quad -2 qe^2 + \frac{3}{2} qe^2 = -\frac{1}{2} qe^2 = qe^2$$

Equilibrium w D:

$$qe^2 \curvearrowright \quad qe \leftarrow \quad qe \downarrow \quad \frac{3}{2} qe \uparrow \quad \frac{3}{2} qe \uparrow$$

Diagramma:





$$\begin{aligned}
 (\star) \quad V_B 6e &= P 2e + P 4e - P 2e \\
 \hookrightarrow V_B &= \frac{4P}{6} = \frac{2P}{3} \\
 (\uparrow) \quad V_A &= 2P - \frac{2P}{3} = \frac{4P}{3}
 \end{aligned}$$

Equilibrio ai nodi:

$$\begin{cases}
 N_2 \frac{\sqrt{2}}{2} = \frac{4P}{3} \rightarrow N_2 = \frac{4\sqrt{2}}{3}P \\
 N_1 = P - N_2 \frac{\sqrt{2}}{2} = P - \frac{4P}{3} = -\frac{P}{3}
 \end{cases}$$

$$\begin{cases}
 N_3 = 0 \\
 N_4 = \frac{4\sqrt{2}}{3}P
 \end{cases}$$

$$\begin{cases}
 N_5 = -P \\
 N_6 = -P/3
 \end{cases}$$

$$\begin{cases}
 N_7 \frac{\sqrt{2}}{2} = P - 4 \frac{\sqrt{2}}{3} P \frac{\sqrt{2}}{2} = -\frac{P}{3} \rightarrow N_7 = -\frac{P}{3} \sqrt{2} \\
 N_8 = 4 \frac{\sqrt{2}}{3} P \frac{\sqrt{2}}{2} - N_7 \frac{\sqrt{2}}{2} = \frac{4P}{3} + \frac{P}{3} = \frac{5P}{3}
 \end{cases}$$

$$\begin{cases}
 N_9 = 0 \\
 N_{10} = \frac{5P}{3}
 \end{cases}$$

$$\begin{cases}
 N_{11} \frac{\sqrt{2}}{2} = -P + \frac{2\sqrt{2}}{3} P \frac{\sqrt{2}}{2} = -\frac{2P}{3} \rightarrow N_{11} = -\frac{2P\sqrt{2}}{3} \\
 N_{12} = -N_{11} \frac{\sqrt{2}}{2} - \frac{P}{3} - \frac{P}{3} \frac{\sqrt{2}}{2} \frac{\sqrt{2}}{2} = \frac{2P}{3} - \frac{2P}{3} = 0
 \end{cases}$$

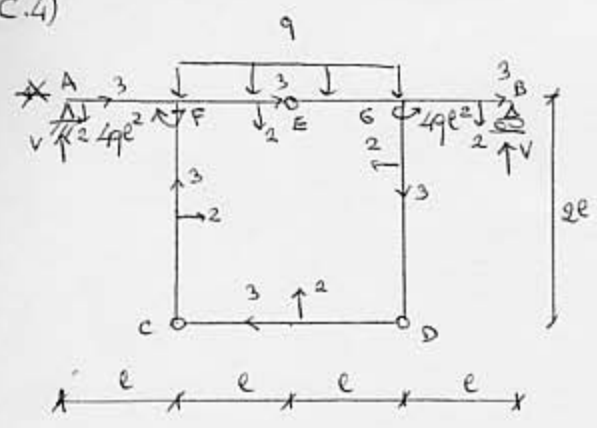
$$\begin{aligned}
 P &= \frac{5P}{3} - \frac{2P\sqrt{2}}{3} \frac{\sqrt{2}}{2} = P \\
 N_{13} &= \frac{2P\sqrt{2}}{3} \frac{\sqrt{2}}{2} = \frac{2P}{3}
 \end{aligned}$$

ASTA	N	kg
1	$-\frac{P}{3}$	-500
2	$\frac{4\sqrt{2}}{3}P$	2828
3	0	0
4	$\frac{4\sqrt{2}}{3}P$	2828
5	-P	-1500
6	$-P/3$	-500
7	$-\frac{P}{3}\sqrt{2}$	-707
8	$\frac{5P}{3}$	2500
9	0	0
10	$\frac{5P}{3}$	2500
11	$-\frac{2P\sqrt{2}}{3}$	-1414
12	0	0
13	$\frac{2P}{3}$	+1000

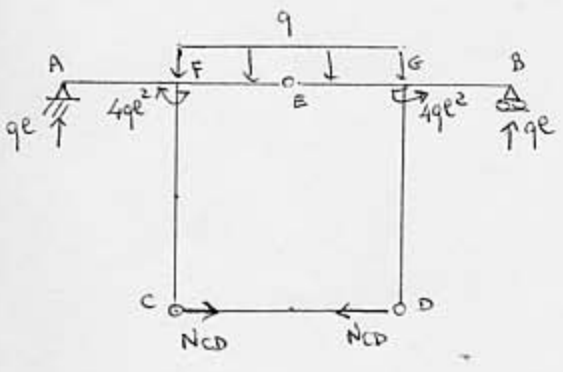


- TIRANTE
 ■ PUNTONE

C.4)



(↑) $\sum V = \sum qe = 750 \text{ kg}$



(E) $\sum_{AFEC} N_{CD} 2e = 4qe^2 + 2qe^2 - \frac{qe^2}{2} = \frac{11}{2}qe^2$

$\rightarrow N_{CD} = \frac{11}{4}qe = 2062 \text{ kg}$

Equilibrio in A: $\begin{matrix} \uparrow qe \\ \downarrow qe \end{matrix}$

Equilibrio di AF: $\begin{matrix} \uparrow qe \\ \downarrow qe \\ \rightarrow qe^2 \\ \leftarrow qe^2 \end{matrix}$

Equilibrio di CF: $\begin{matrix} \uparrow \frac{11}{2}qe^2 \\ \leftarrow \frac{11}{4}qe \\ \rightarrow \frac{11}{4}qe \end{matrix}$

Equilibrio in F: $\begin{matrix} \uparrow qe^2 \\ \downarrow qe \\ \leftarrow \frac{11}{4}qe \\ \rightarrow \frac{11}{4}qe \\ \uparrow \frac{11}{4}qe \\ \downarrow \frac{11}{4}qe \end{matrix} \quad (4 + 1 - \frac{11}{2})qe^2 = -qe^2$

Diagrammi:

