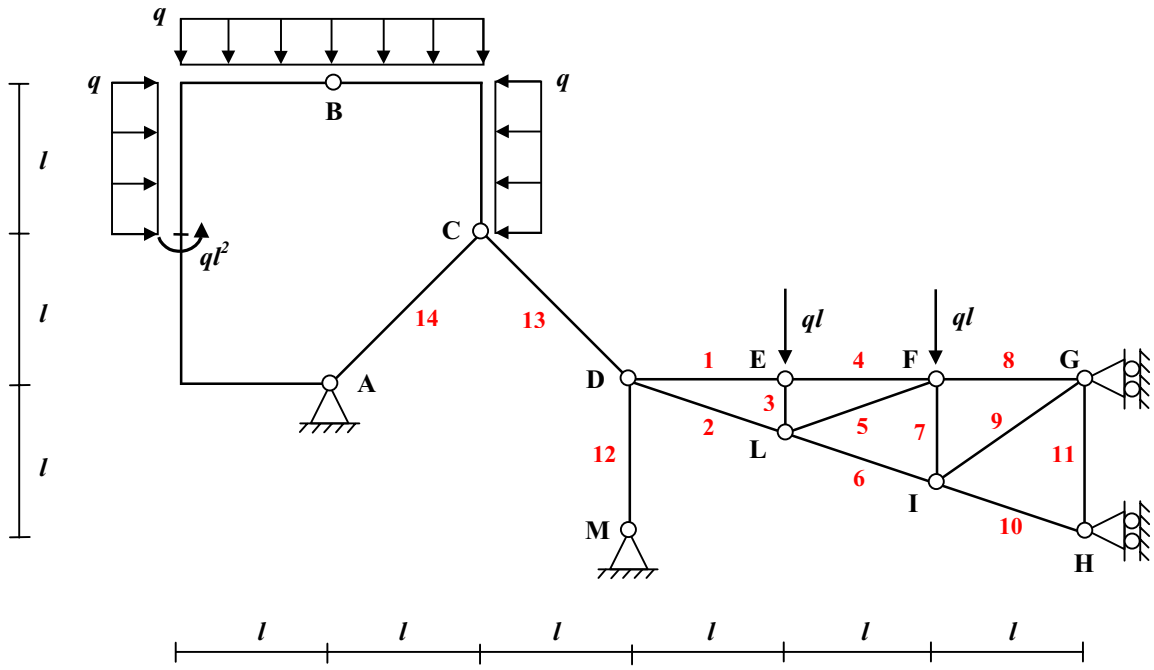
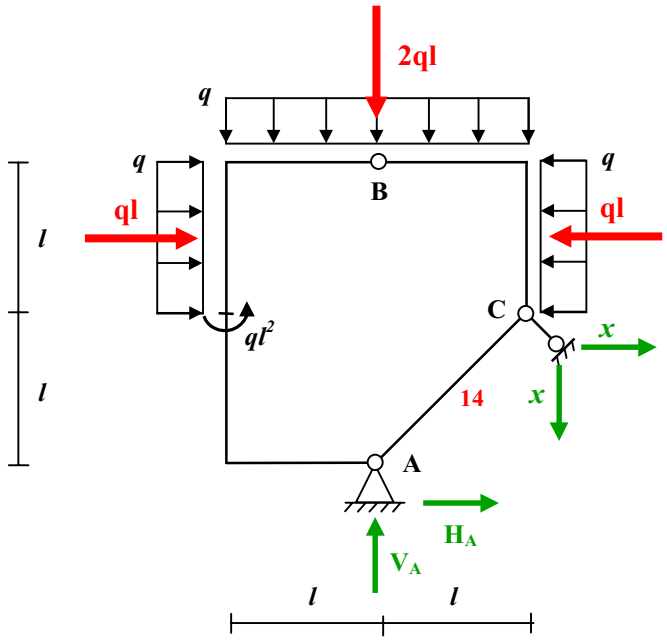
Determinare le reazioni vincolari e tracciare i diagrammi di sollecitazione della seguente struttura , riportando in una apposita tabella i valori degli sforzi assiali per le aste numerate .

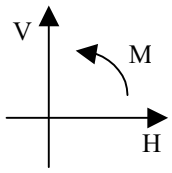


Calcolo delle reazioni vincolari :

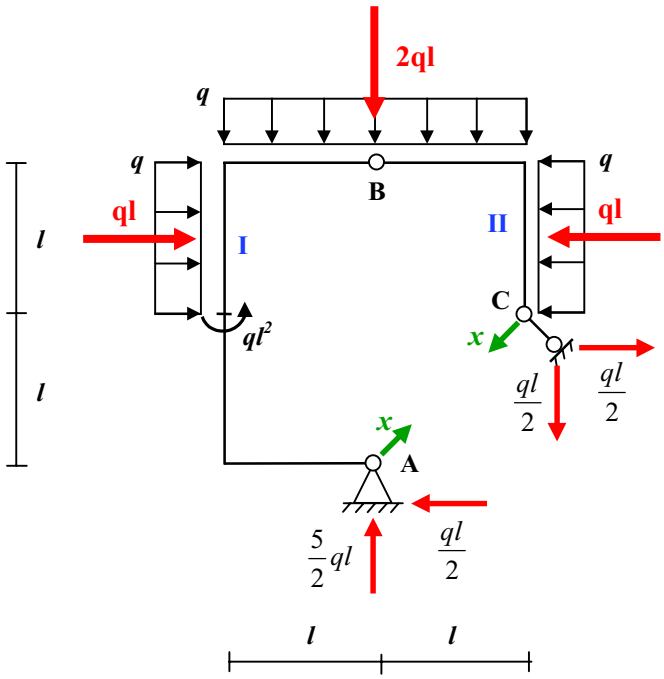
Considerando la sottostruttura isostatica ABC , tramite equazioni cardinali della statica avremo :



$$\begin{cases} \sum_H : \quad H_A + x = 0 \\ \sum_V : \quad V_A - 2ql - x = 0 \\ \sum_M (A): \quad ql^2 - x \cdot l - x \cdot l = 0 \end{cases} \Rightarrow \begin{cases} H_A = -\dfrac{ql}{2} \\ V_A = \dfrac{5}{2}ql \\ x = \dfrac{ql}{2} \end{cases}$$



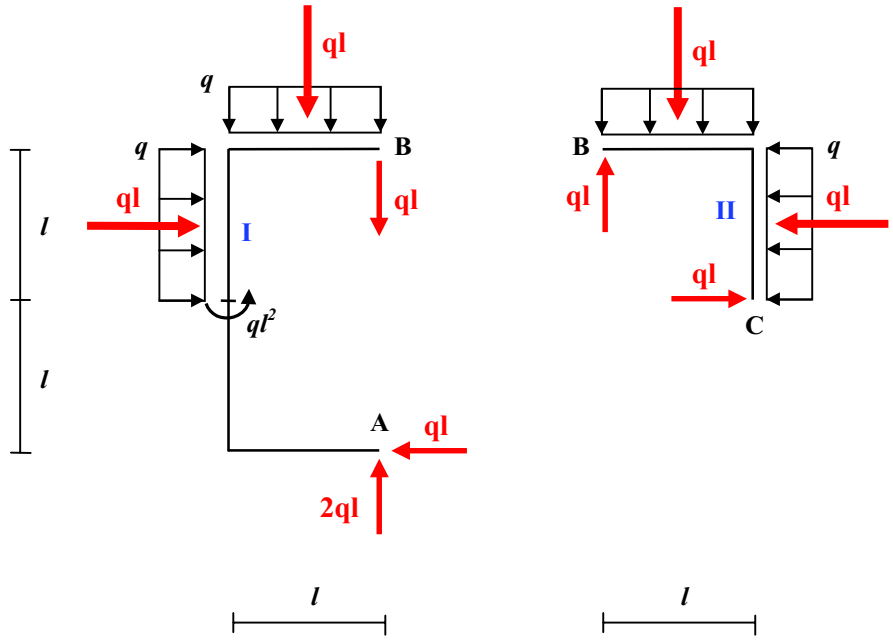
Si ha quindi per il sistema equilibrato :



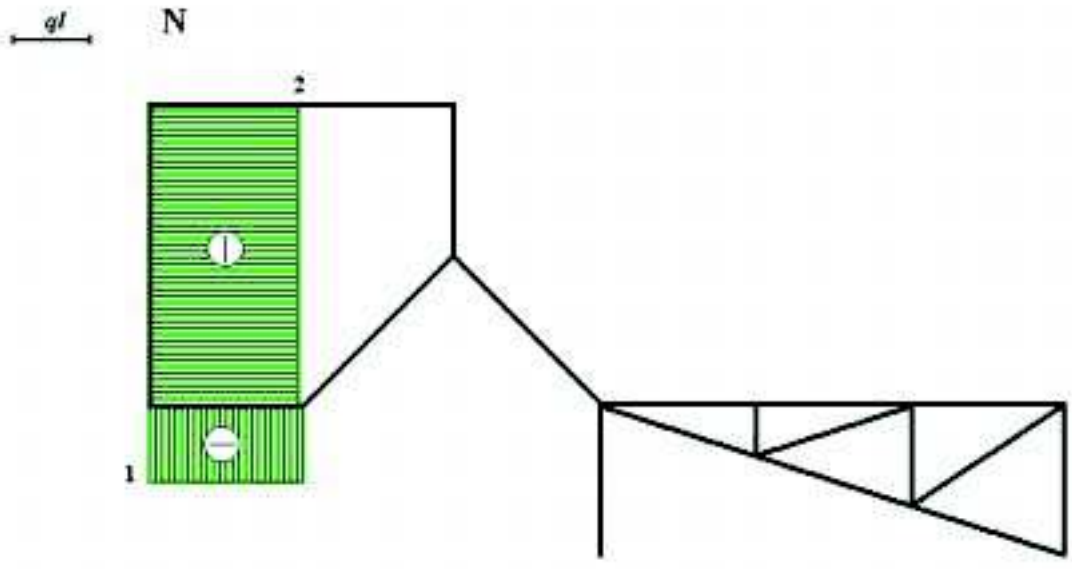
Impostando un'equazione ausiliaria in B sul II tronco si ha :

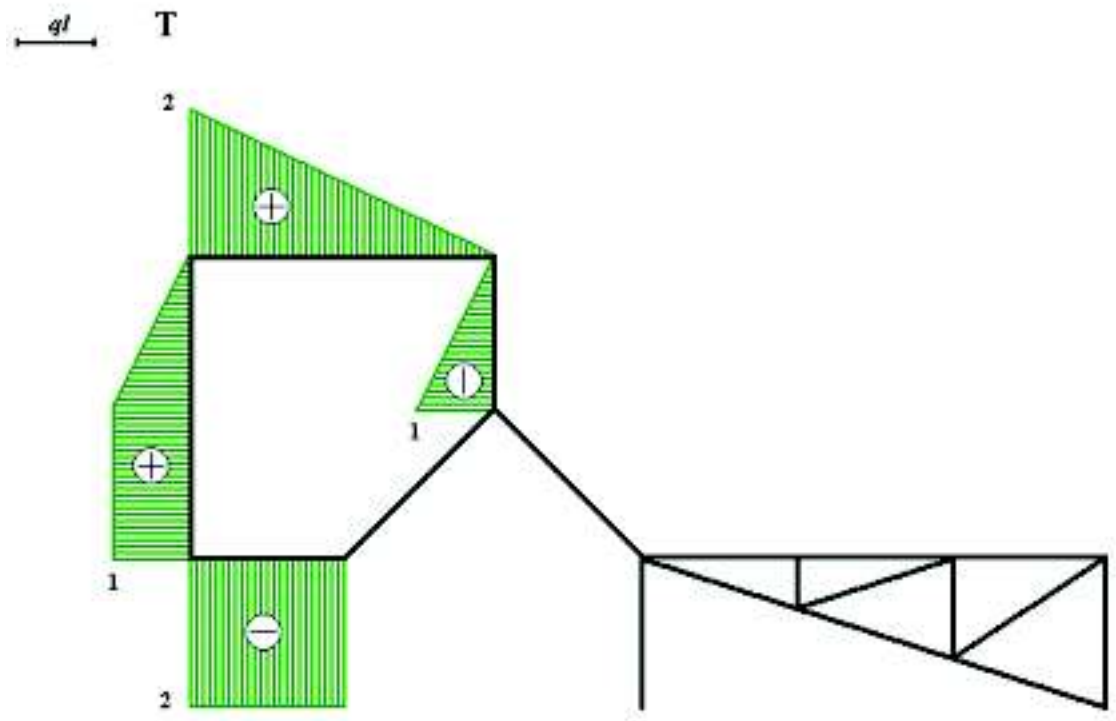
$$\sum_M B : -\frac{ql}{2} \cdot l + \frac{ql}{2} \cdot l - x \cdot l\sqrt{2} - \frac{ql}{2} \cdot l - \frac{ql}{2} \cdot l \quad \Rightarrow \quad x = -\frac{ql}{\sqrt{2}}$$

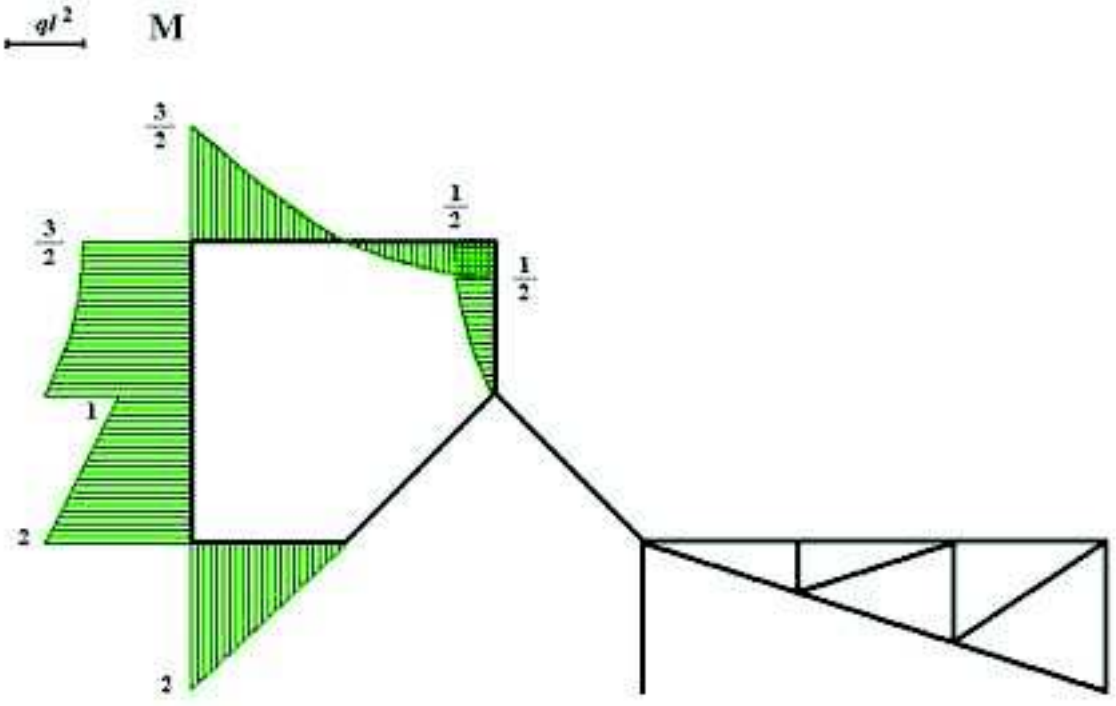
Isolando di conseguenza i due tronchi , per il relativo equilibrio si ha :



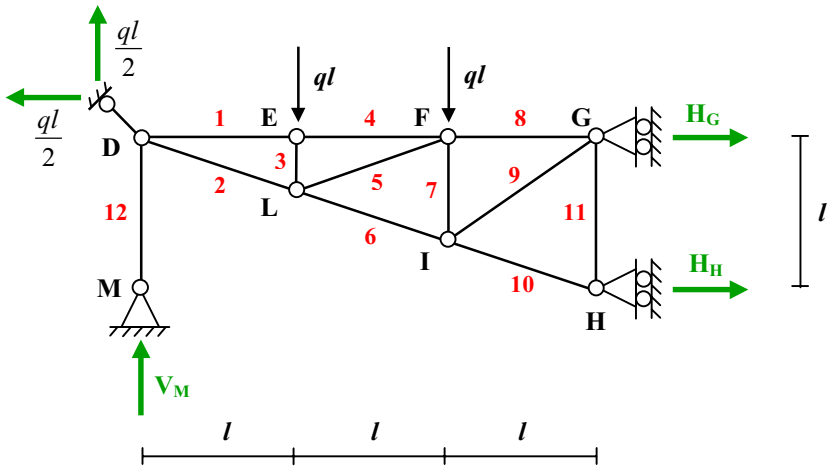
Diagrammi delle caratteristiche di sollecitazione .




ql
T
2
1
1
2

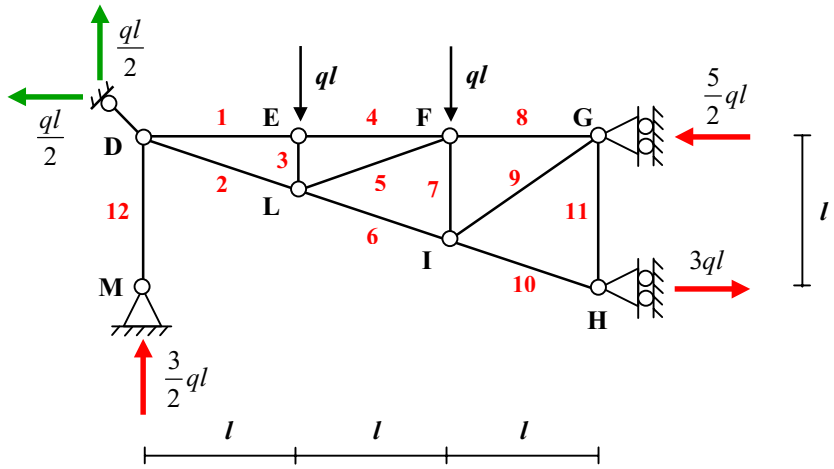

ql 2
M
3/2
1/2
3/2
1/2
1
2
2

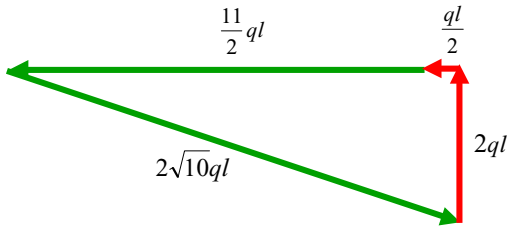
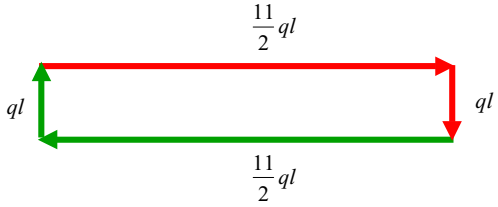
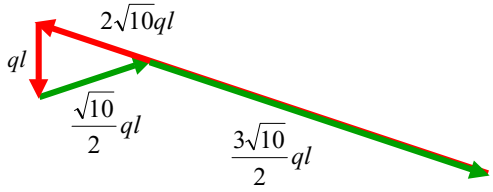
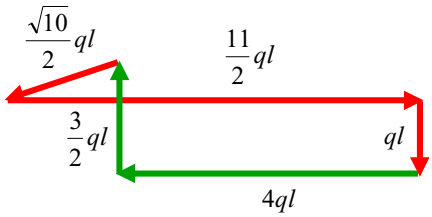
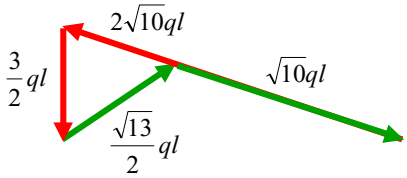
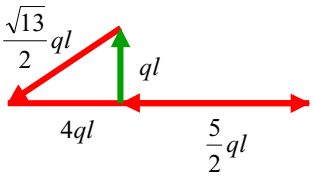
Per la reticolare MDGH , applicando le equazioni cardinali , si ottiene :



$$\begin{cases} \sum_H : \quad -\frac{ql}{2} + H_H + H_G = 0 \\ \sum_V : \quad V_M + \frac{ql}{2} - ql - ql = 0 \\ \sum_M (D): \quad -ql \cdot l - ql \cdot 2l + H_H \cdot l = 0 \end{cases} \Rightarrow \begin{cases} H_G = -\frac{5}{2}ql \\ V_M = \frac{3}{2}ql \\ H_H = 3ql \end{cases}$$

La struttura equilibrata risulta quindi :



EQUILIBRIO NODO D	EQUILIBRIO NODO E
	
EQUILIBRIO NODO L	**EQUILIBRIO NODO F**
	
EQUILIBRIO NODO I	**EQUILIBRIO NODO G**
	

Riassumendo :

ASTE	TIRANTE	PUNTONE	ASTE	TIRANTE	PUNTONE
1		$\frac{11}{2}ql$	8		$4ql$
2	$2\sqrt{10}ql$		9	$\frac{\sqrt{13}}{2}ql$	
3		ql	10	$\sqrt{10}ql$	
4		$\frac{11}{2}ql$	11		ql
5	$\frac{\sqrt{10}}{2}ql$		12		$\frac{3}{2}ql$
6	$\frac{3}{2}\sqrt{10}ql$		13	$\frac{\sqrt{2}}{2}ql$	
7		$\frac{3}{2}ql$	14		$\frac{\sqrt{2}}{2}ql$