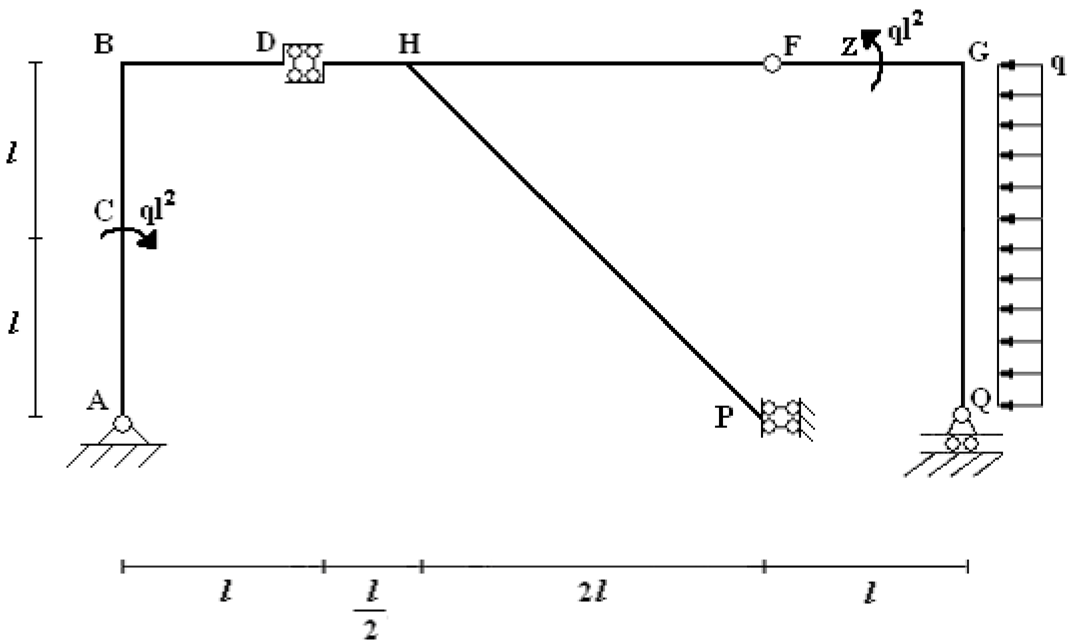
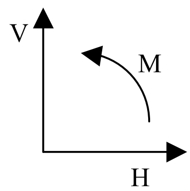
Calcolare le reazioni vincolari e tracciare i diagrammi quotati delle caratteristiche della sollecitazione .

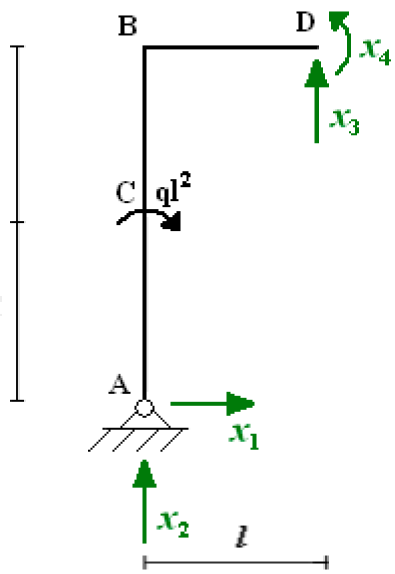




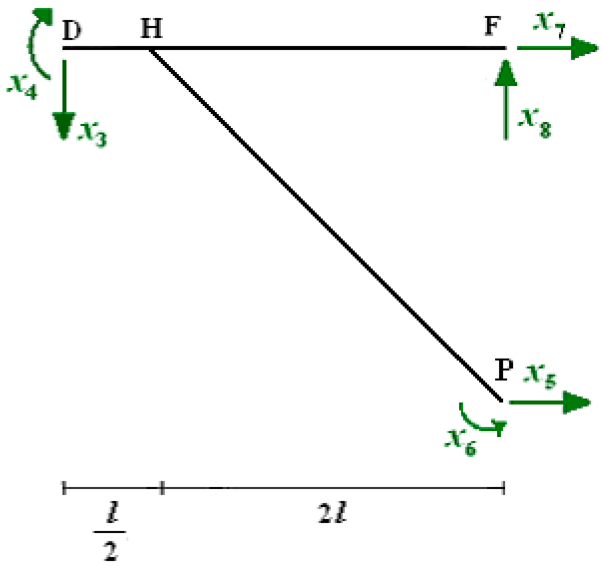
Utilizzando il metodo generale dell'isolamento per tronchi , applicando le equazioni cardinali della statica si ha :

I° Tronco :

$$\begin{cases} \sum_H \quad : \quad x_1 = 0 \\ \sum_V \quad : \quad x_2 + x_3 = 0 \\ \sum_M (A) \quad : x_3 \cdot l + x_4 - ql^2 = 0 \end{cases}$$

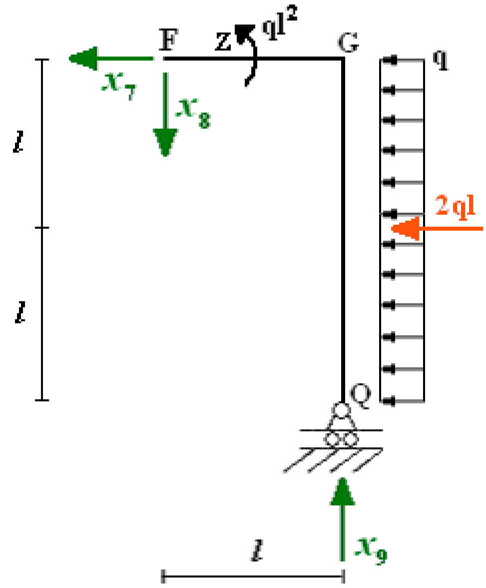


II° Tronco :



$$\begin{cases} \sum_H : x_5 + x_7 = 0 \\ \sum_V : -x_3 + x_8 = 0 \\ \sum_M (P): -x_4 + x_3 \cdot \frac{5}{2} l + x_6 - x_7 \cdot 2l = 0 \end{cases}$$

III° Tronco :



$$\begin{cases} \sum_H : -x_7 - 2ql = 0 \quad \Rightarrow \quad x_7 = -2ql \\ \sum_V : -x_8 + x_9 = 0 \quad \Rightarrow \quad x_9 = ql \\ \sum_M (Q) : x_7 \cdot 2l + x_8 \cdot l + ql^2 + 2ql^2 = 0 \quad \Rightarrow \quad x_8 = ql \end{cases}$$

Risolvendo , tramite sostituzione , simultaneamente i due sistemi relativi ai primi due tronchi si ha :

$$\begin{cases} \sum_H : x_1 = 0 \\ \sum_V : x_2 + x_3 = 0 \\ \sum_M (A) : x_3 \cdot l + x_4 - ql^2 = 0 \end{cases} , \quad \begin{cases} \sum_H : x_5 + x_7 = 0 \\ \sum_V : -x_3 + x_8 = 0 \\ \sum_M (P): -x_4 + x_3 \cdot \frac{5}{2} l + x_6 - x_7 \cdot 2l = 0 \end{cases}$$

$$x_1 = 0$$

$$x_2 = -ql$$

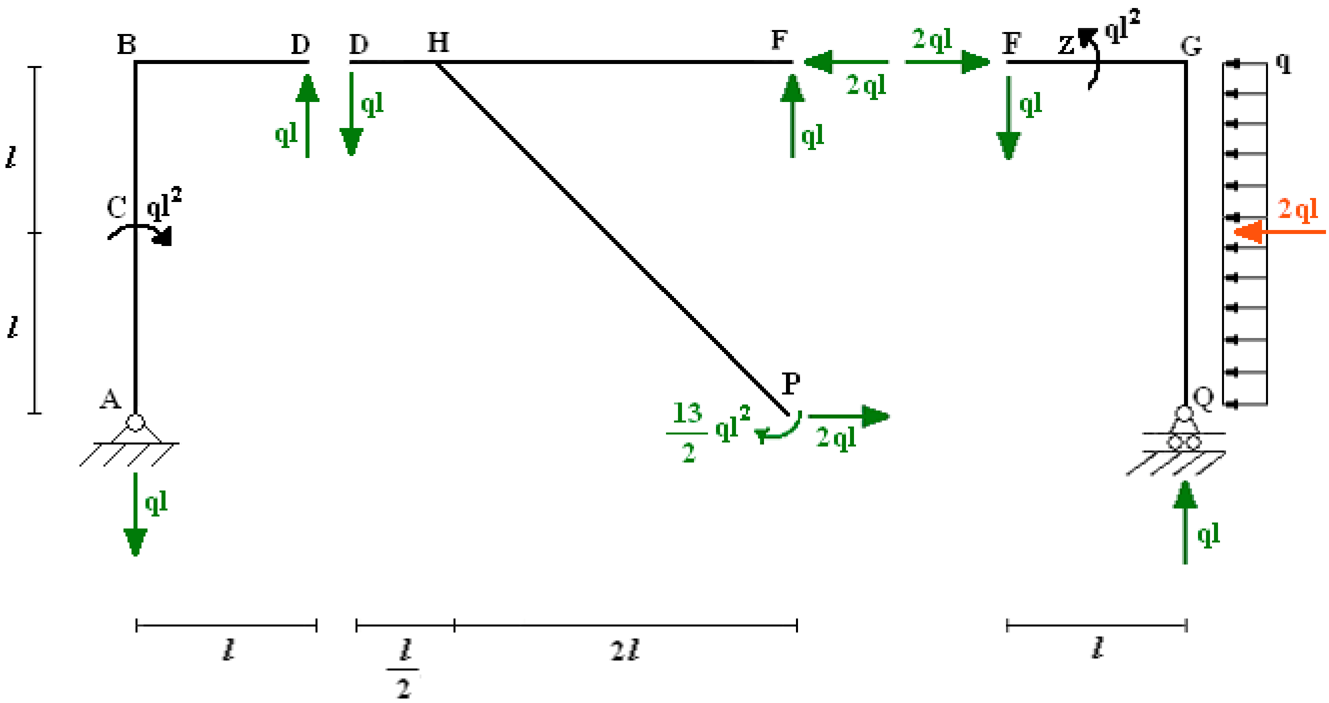
$$x_3 = ql$$

$$x_4 = 0$$

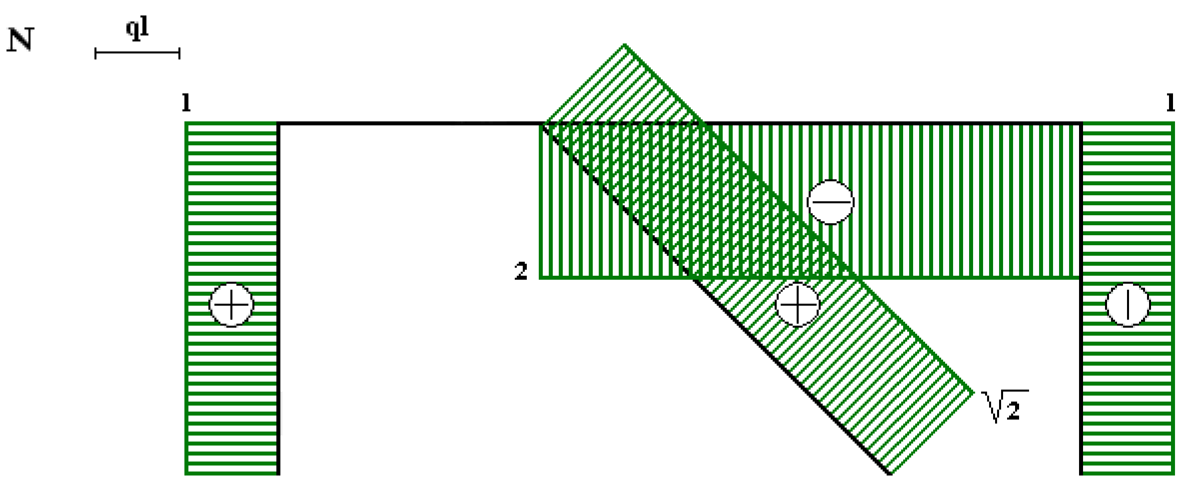
$$x_5 = 2ql$$

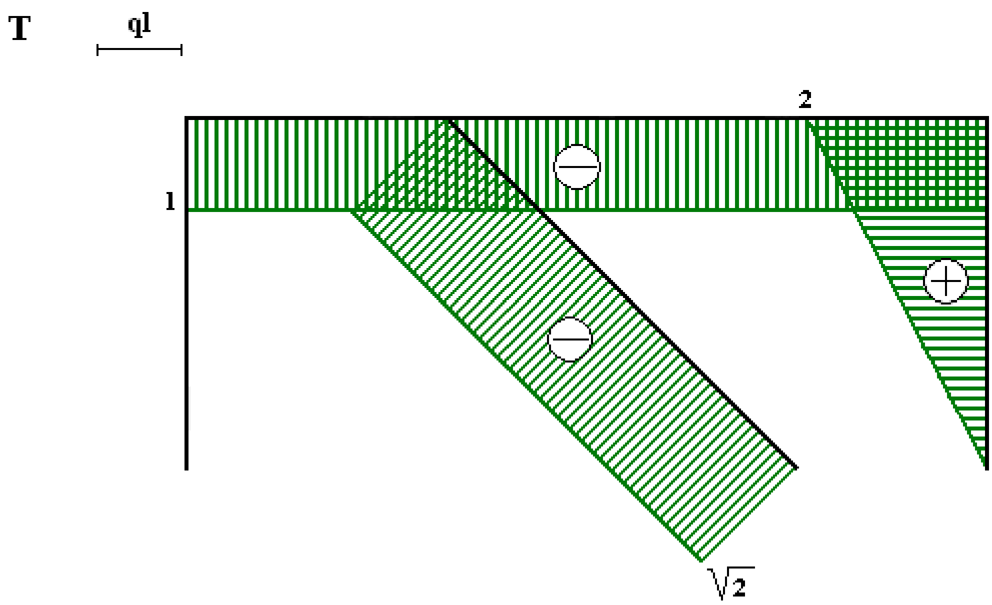
$$x_6 = -\frac{13}{2}ql^2$$

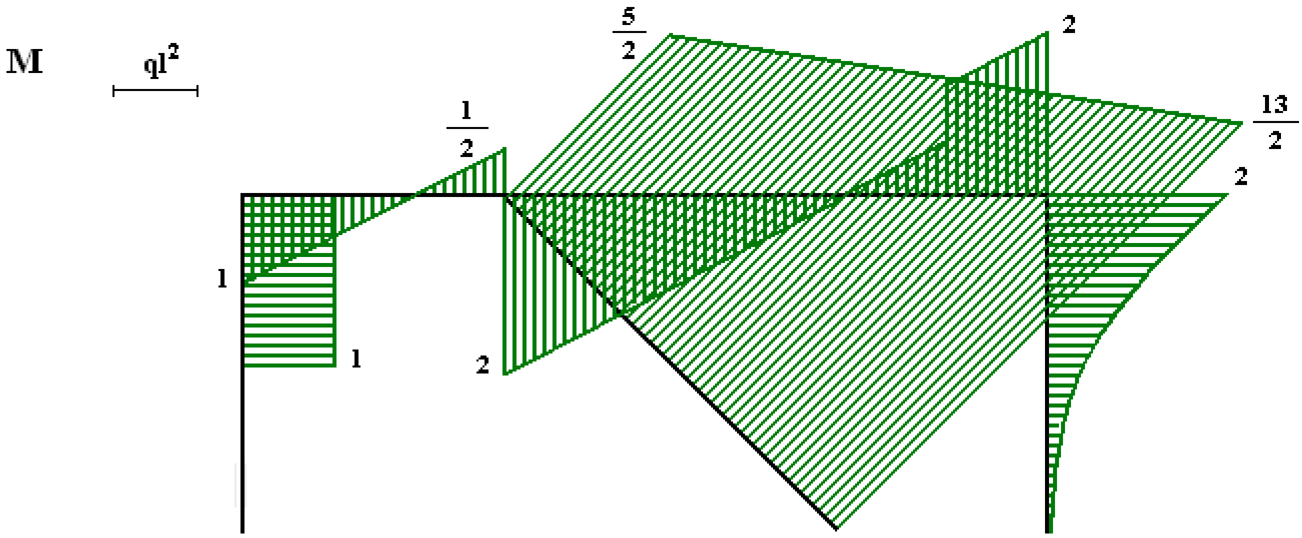
Riassumendo :



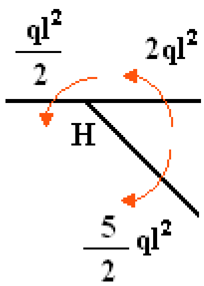
Diagrammi :



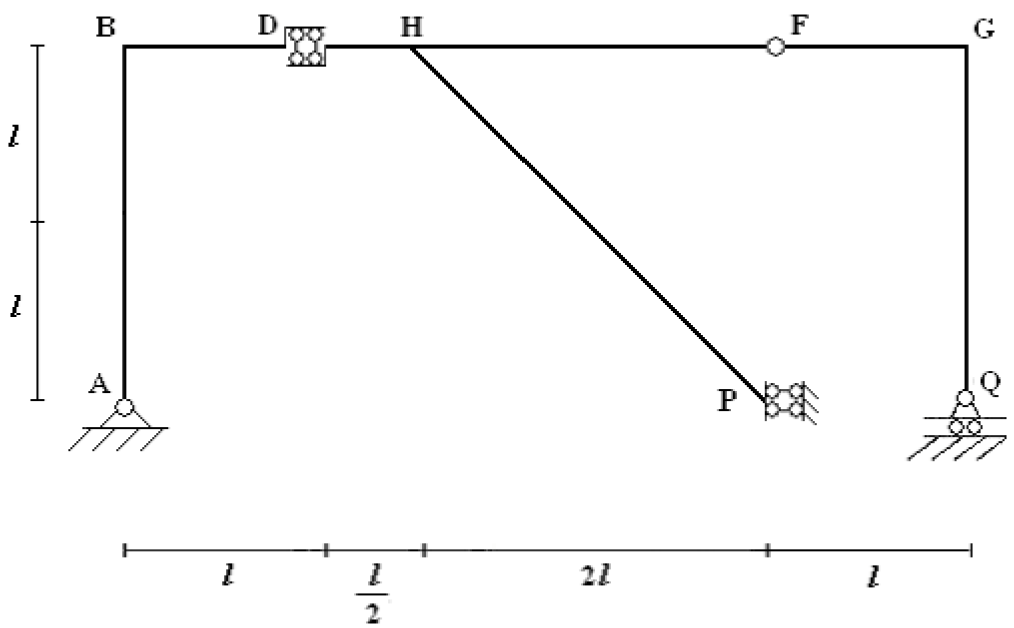




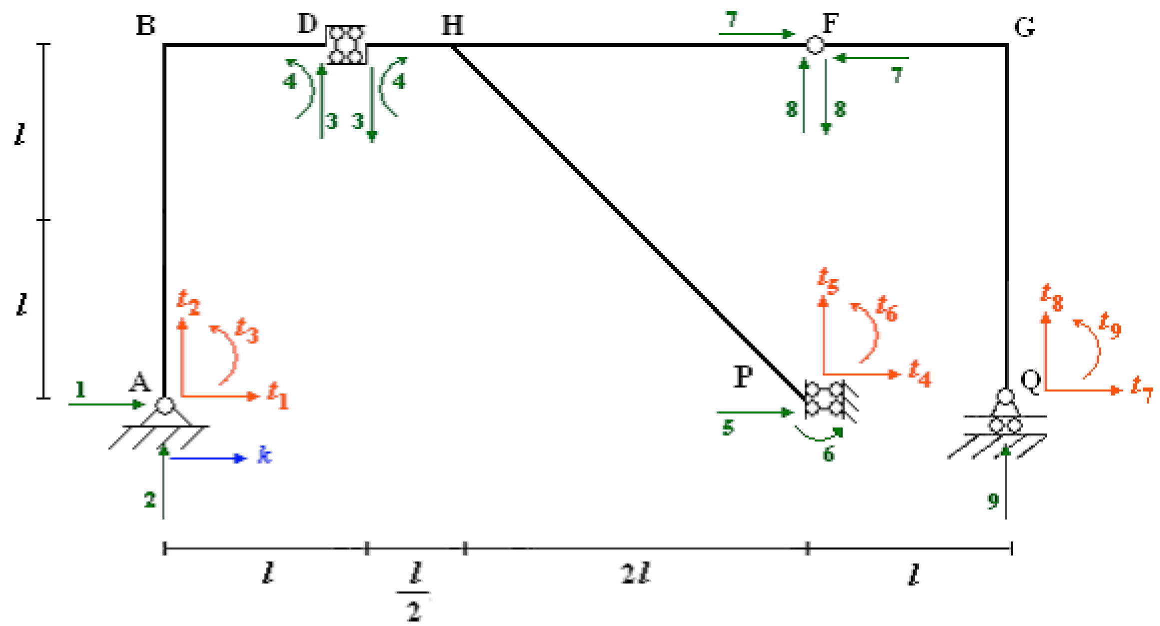
Verifica dell'equilibrio nel punto H



Della struttura sotto definita determinare i diagrammi dello spostamento corrispondenti ad un cedimento vincolare orizzontale , di valore prefissato *k* , in P .



Impostando il sistema lineare sulla struttura :



$$
\begin{cases}
dA_1 = k \\
dA_2 = 0 \\
dD_3{}^{I} - dD_3{}^{II} = 0 \\
dD_4{}^{I} - dD_4{}^{II} = 0 \\
dP_5 = 0 \\
dP_6 = 0 \\
dF_7{}^{II} - dF_7{}^{III} = 0 \\
dF_8{}^{II} - dF_8{}^{III} = 0 \\
dQ_9 = 0
\end{cases}
\Rightarrow
\begin{cases}
t_1 = k \\
t_2 = 0 \\
(t_2 + t_3 \cdot l) - \left(t_5 + t_6 \cdot (-\frac{5}{2} l) \right) = 0 \\
t_3 - t_6 = 0 \\
t_4 = 0 \\
t_6 = 0 \\
(t_4 - t_6 \cdot 2l) - (t_7 - t_9 \cdot (-l)) = 0 \\
(t_5 + t_6 \cdot 0) - (t_8 + t_9 \cdot (-l)) = 0 \\
t_8 = 0
\end{cases}
\Rightarrow
\begin{cases}
t_1 = k \\
t_2 = 0 \\
t_3 = 0 \\
t_6 = 0 \\
t_4 = 0 \\
t_5 = 0 \\
t_7 = 0 \\
t_9 = 0 \\
t_8 = 0
\end{cases}
$$

Si arriva quindi a :