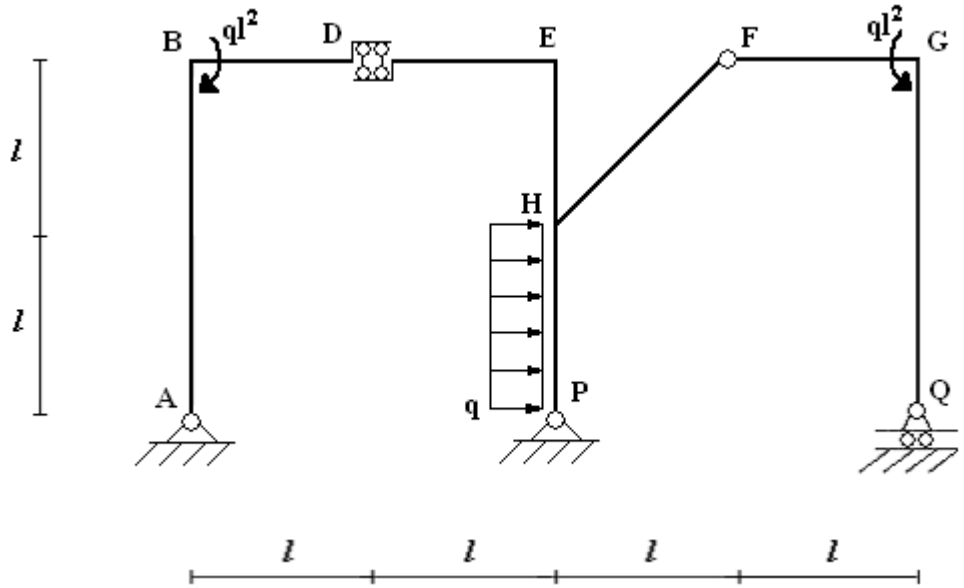
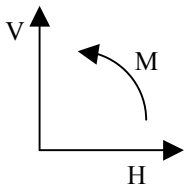
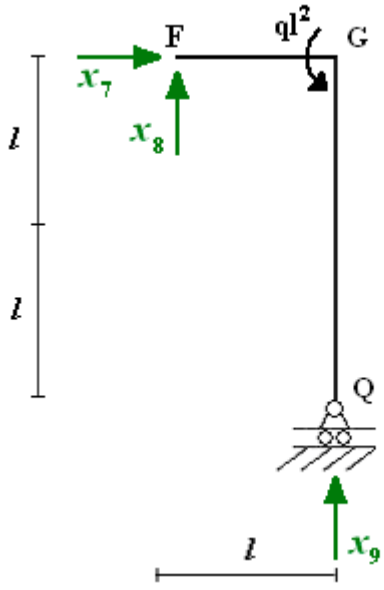
Calcolare le reazioni vincolari e tracciare i diagrammi quotati delle caratteristiche della sollecitazione .



Applicando le equazioni cardinali della statica al III° tronco (isostatico) si ha :



III° Tronco :

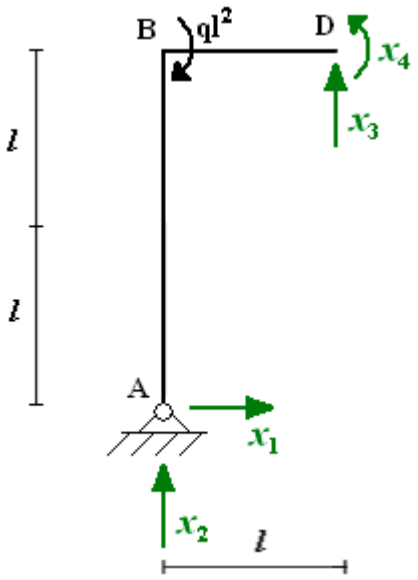


$$\begin{cases} \sum_H \; : \; x_7 = 0 \quad \Rightarrow \quad x_7 = 0 \\ \sum_V \; : \; x_8 + x_9 = 0 \quad \Rightarrow \quad x_8 = ql \\ \sum_M (F) \; : \; +ql^2 + x_9 \cdot l = 0 \quad \Rightarrow \quad x_9 = -ql \end{cases}$$

Impostando quindi altrettante equazione cardinali ai primi due tronchi (dopo averli isolati) si ottiene :

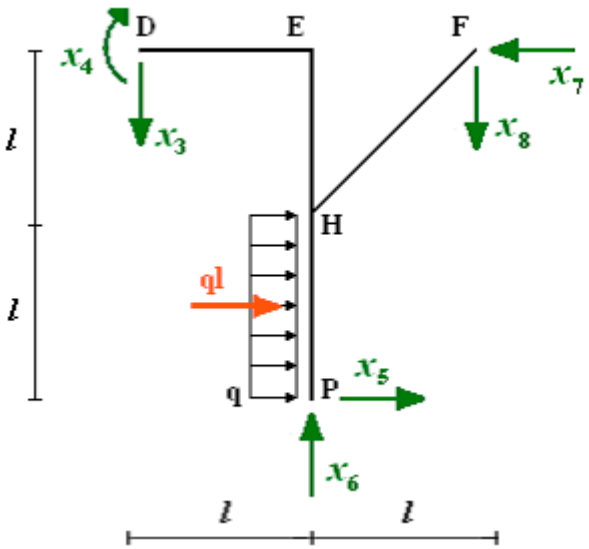
I° Tronco :

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



II° Tronco :

$$\begin{cases} \sum_H \; : \; x_5 + ql - x_7 = 0 \\ \sum_V \; : \; -x_3 + x_6 - x_8 = 0 \\ \sum_M (F) : \; -x_4 + x_3 \cdot 2l + ql \cdot \frac{3}{2} l - x_6 \cdot l + x_5 \cdot 2l = 0 \end{cases}$$



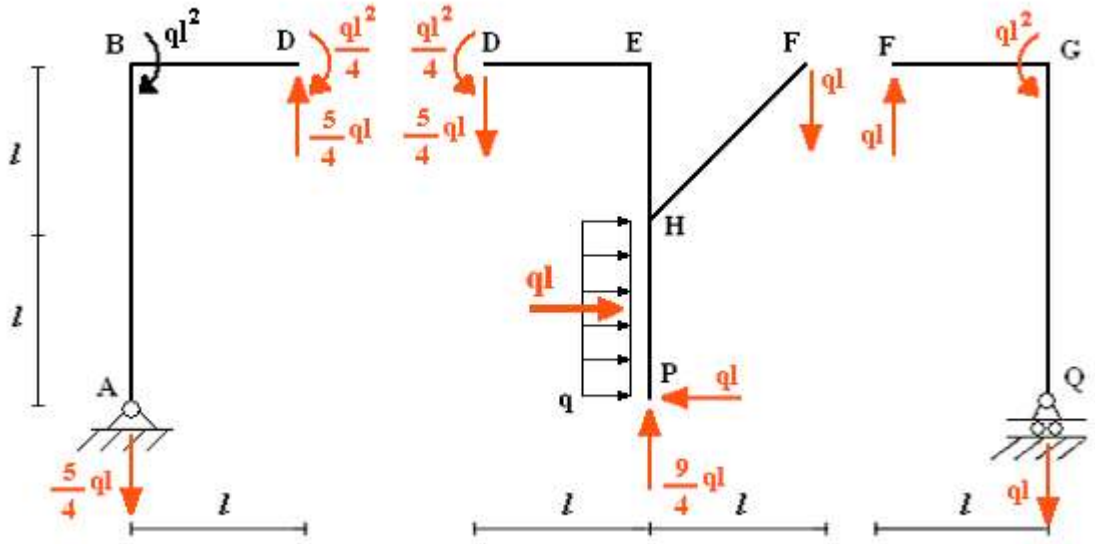
Risolvendo , tramite sostituzione , simultaneamente i due sistemi relativi ai due tronchi si ha :

$$\begin{cases} \sum_H \ : \ x_1 = 0 \\ \sum_V \ : \ x_2 + x_3 = 0 \\ \sum_M (A) \ : x_3 \cdot l + x_4 - ql^2 = 0 \end{cases} , \quad \begin{cases} \sum_H \ : \ x_5 + ql - x_7 = 0 \\ \sum_V \ : -x_3 + x_6 - x_8 = 0 \\ \sum_M (F) : \ -x_4 + x_3 \cdot 2l + ql \cdot \frac{3}{2} l - x_6 \cdot l + x_5 \cdot 2l = 0 \end{cases}$$

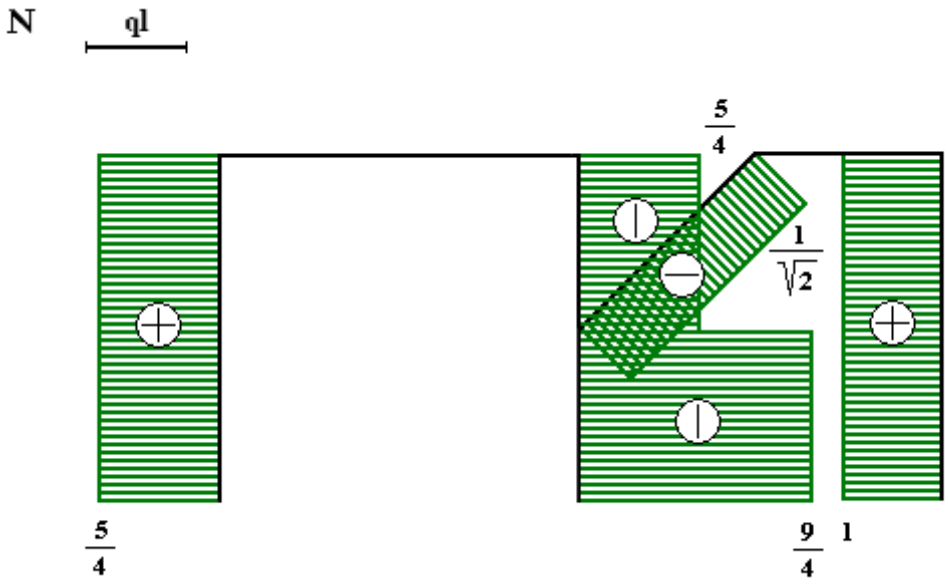
$$\boxed{x_1 = 0} \qquad \boxed{x_2 = -\frac{5}{4} ql} \qquad \boxed{x_3 = \frac{5}{4} ql} \qquad \boxed{x_4 = -\frac{ql^2}{4}}$$

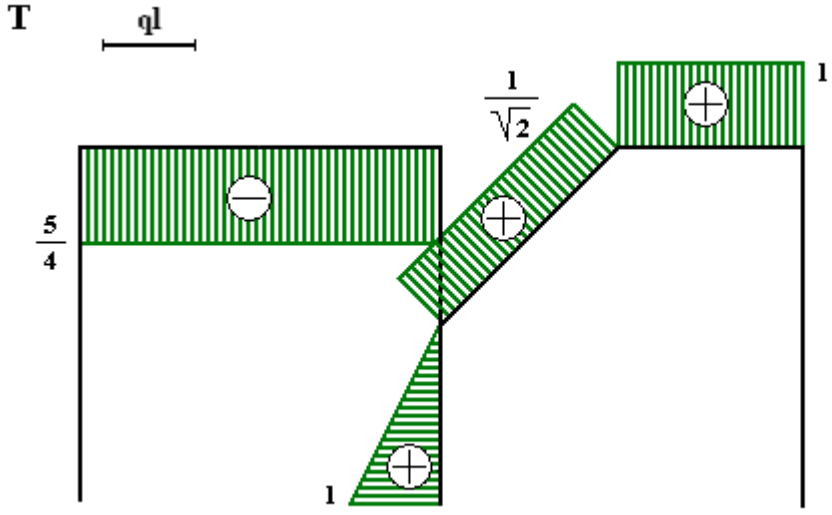
$$\boxed{x_5 = -ql} \qquad \boxed{x_6 = \frac{9}{4} ql}$$

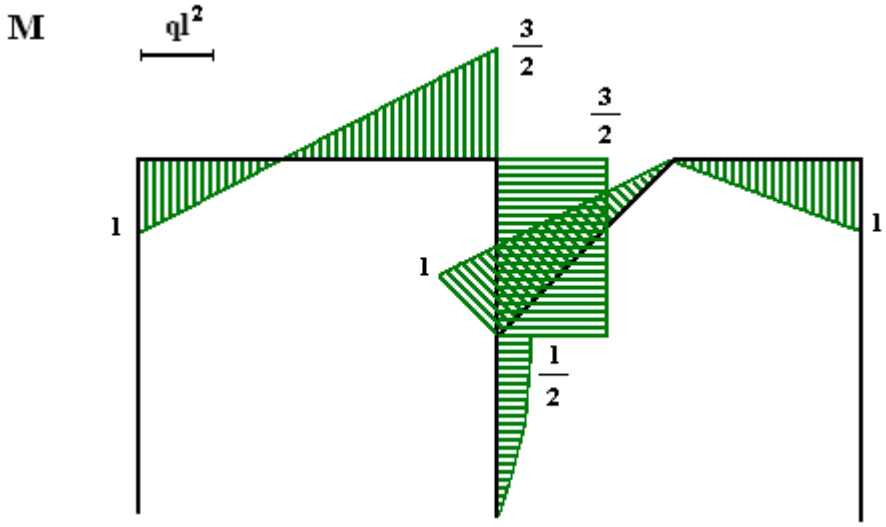
Riassumendo :



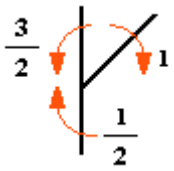
Diagrammi :



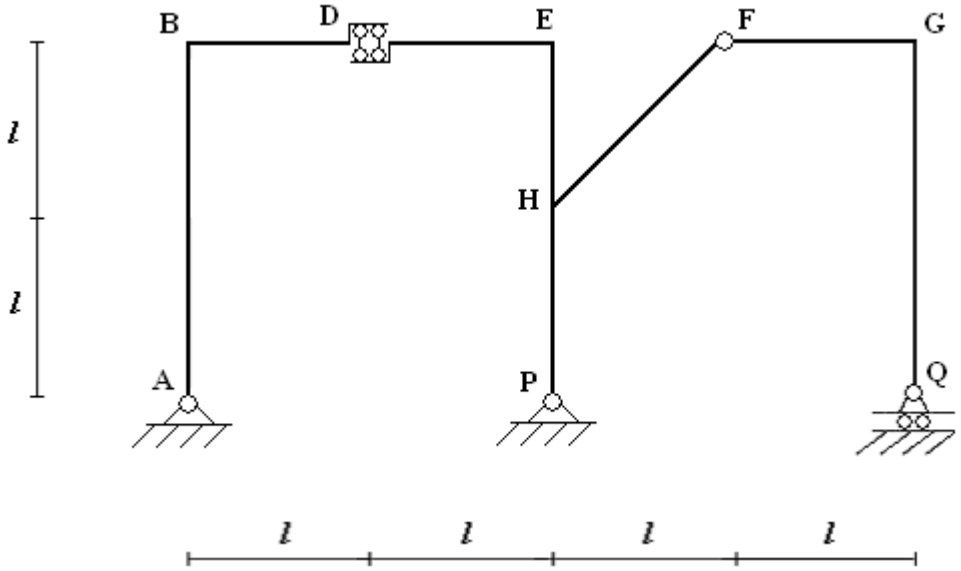




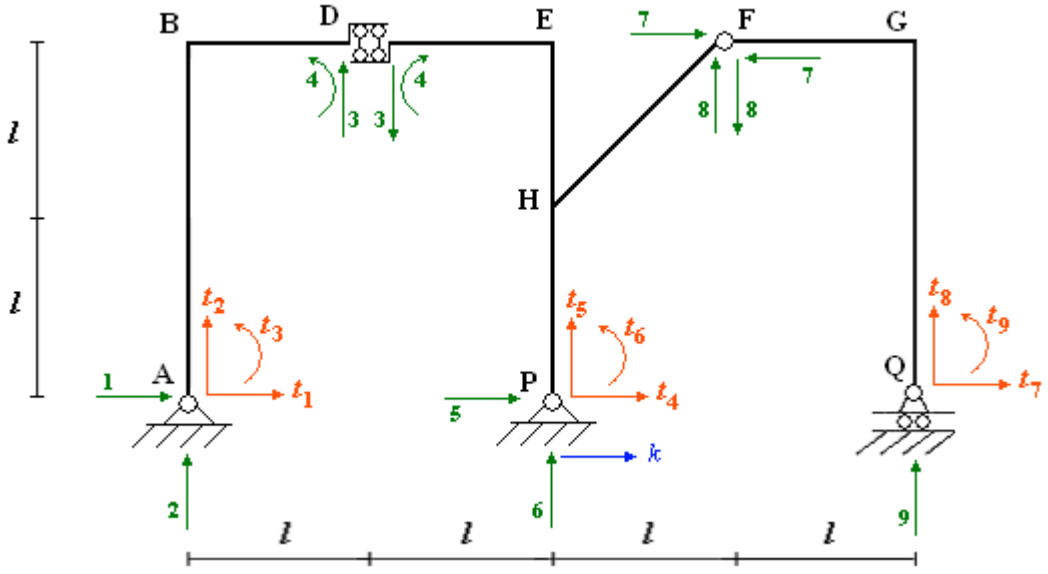
Verifica dell'equilibrio nel punto H



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 :



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

Si arriva quindi a :