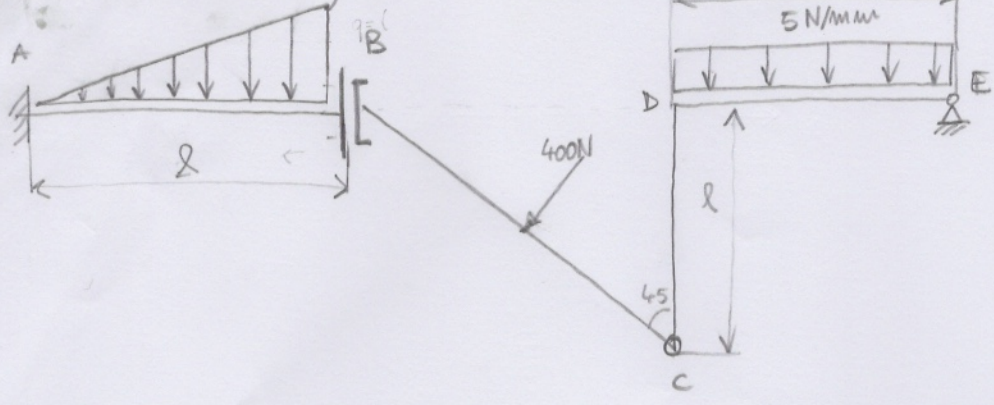


ES. ISOSTATICA $q_{MAX} = 10 \text{ N/mm}$

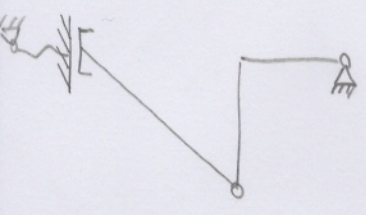


NO DO	GDV
A	3
B	2
C	2
E	2
TOT	9

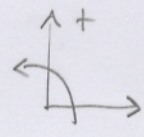
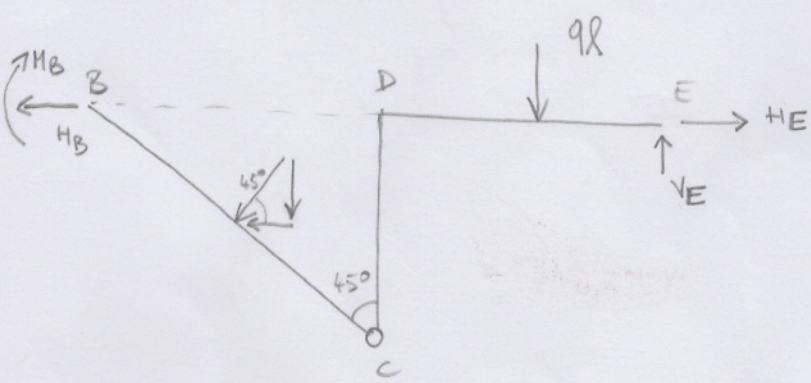
$GDV = 9 = 9 DOV \rightarrow ISO.$

AB → FISSO

ARC. A 3 CERN NON LAB.



EQ. BCDE



1

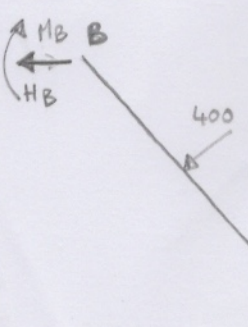
$\uparrow V_D - q \cdot l - 400 \cdot S_{45} = 0 \rightarrow V_D = 2782.8427 \text{ N}$

2

$\curvearrowright \frac{q \cdot l^2}{2} + 400 \cdot S_{45} \cdot \frac{3}{2} \cdot l - 400 \cdot C_{45} \cdot \frac{l}{2} - M_B = 0 \rightarrow M_B = 766421.3562 \text{ Nmm}$

EQ. BC

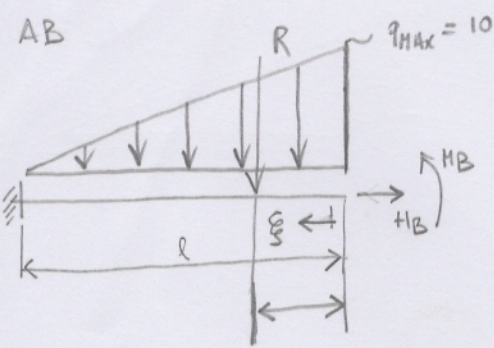
3



$\curvearrowright 400 \cdot \frac{l\sqrt{2}}{2} + H_B \cdot l - M_B = 0 \rightarrow H_B = \frac{M_B - 400 \cdot \frac{l\sqrt{2}}{2}}{l} = 1250 \text{ N}$

4

$H_E - H_B - 400 \cdot C_{45} = 0 \rightarrow H_E = H_B + 400 \cdot C_{45} = 1532.8427 \text{ N}$

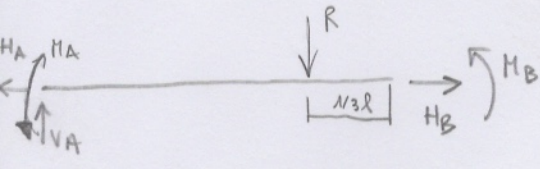


$$R = \frac{q_{max} \cdot l}{2} = 2500 \text{ N}$$

$$q(\xi) = q_{max} - \frac{q_{max}}{l} \cdot \xi$$

$$\bar{\xi} = \frac{\int_0^l \xi q(\xi) d\xi}{R} = \frac{\int_0^l \xi (q_{max} - \frac{q_{max}}{l} \xi) d\xi}{\frac{q_{max} l}{2}}$$

$$= \frac{\frac{q_{max} \xi^2}{2} - \frac{q_{max} \xi^3}{3l}}{\frac{q_{max} l}{2}} = \frac{\frac{q_{max} l^2}{2} - \frac{q_{max} l^2}{3}}{\frac{q_{max} l}{2}} = \frac{3q_{max} l^2 - 2q_{max} l^2}{3q_{max} l} = \frac{q_{max} l^2}{3q_{max} l} = \frac{1}{3} l$$



$$H_A = H_B = 1250 \text{ N}$$

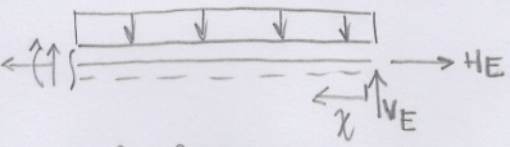
$$V_A = R = 2500 \text{ N}$$

$$\sum M_A \uparrow + H_A + H_B - R \cdot \frac{2}{3} l = 0$$

$$H_A = -H_B + R \cdot \frac{2}{3} l = 6.6911 \cdot 9771 \text{ Nmm}$$

A2. INTERNE

E → D



$$0 < x < l = 500$$

$$N = H_E = 1532.8427 \text{ N}$$

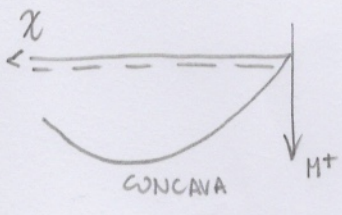
$$T = -V_E + 5 \cdot x \rightarrow \begin{cases} T(0) = -V_E = -2782.8427 \text{ N} \\ T(500) = -2828427 \text{ N} \end{cases}$$

$$T = 0 \quad \bar{x} = \frac{V_E}{5} = 556 \rightarrow \text{fuori intervallo}$$

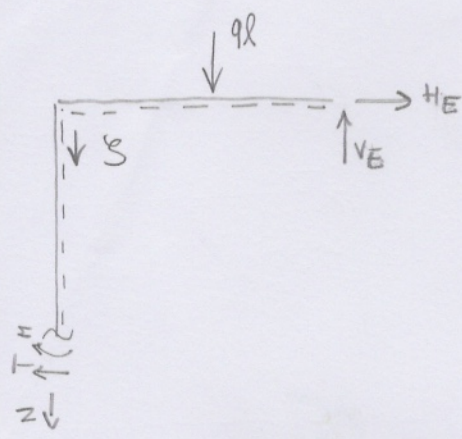
$$M = V_E x - \frac{q x^2}{2} \rightarrow \begin{cases} M(0) = 0 \\ M(500) = 766421.3562 \text{ Nmm} \end{cases}$$

$$\frac{dM}{dx} = V_E - qx$$

$$\frac{d^2 M}{dx^2} = -q < 0$$



D → C



$$0 < \xi < l = 500$$

$$N = V_E - ql = 282.8427 \text{ N}$$

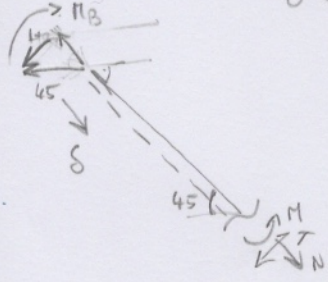
$$T = H_E = 1532.8427 \text{ N}$$

$$M = -\frac{ql^2}{2} + V_E \cdot l - H_E \cdot \xi$$

$$M(0) = 766421.3562 \text{ Nmm}$$

$$M(500) = \emptyset \text{ OK}$$

B → C



$$0 < \delta < l_0/2 \approx 353.5534$$

$$l_0 = l\sqrt{2}$$

$$N = +H_B \cdot \cos 45 = +883.8835 \text{ N}$$

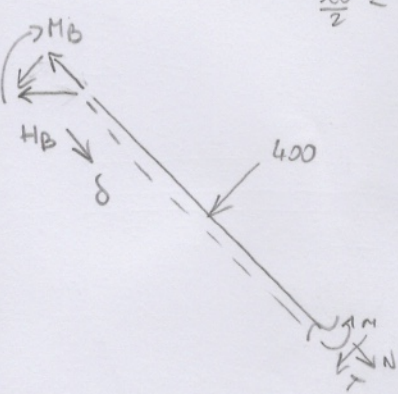
$$T = -H_B \sin 45 = -883.8835 \text{ N}$$

$$M = M_B - H_B \sin 45 \delta$$

$$M(0) = M_B = 766421.3562 \text{ Nmm}$$

$$M(l_0/2) = 453321.3562 \text{ Nmm}$$

B-C



$$\frac{l_0}{2} < \delta < l$$

$$N = +883.8835$$

$$T = -H_B \sin 45 - 400 = -1283.8835 \text{ N}$$

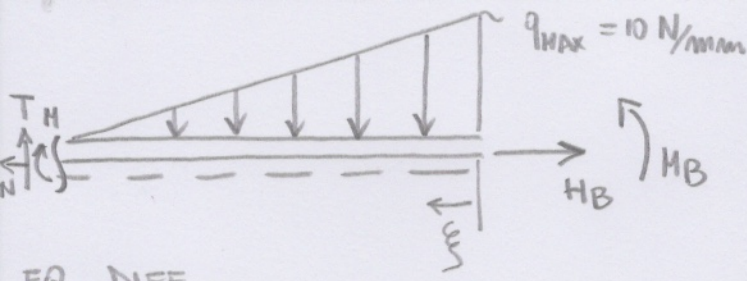
$$M = M_B - H_B \sin 45 \cdot \delta - 400(\delta - \frac{l_0}{2})$$

$$M(l_0/2) = 453321.3562 \text{ Nmm}$$

$$M(l) = \emptyset \text{ OK } 562 \text{ Nmm}$$

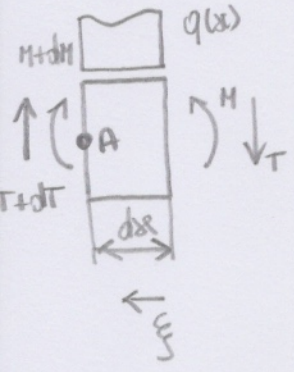
$$M = M_B - H_B \sin 45 \delta - 400\delta + 400 \frac{l_0}{2}$$

$$M = M_B - (H_B \sin 45 + 400)\delta + 400 \frac{l_0}{2}$$



trascuro perché è un inf. di ordine superiore

EQ. DIFF.



$$\uparrow T + dT - T - q(x) dx = 0$$

$$\boxed{\frac{dT}{dx} = q(x)}$$

$$\curvearrowright -M - dM + M - T dx - q(x) \frac{dx^2}{2}$$

$$-dM - T dx = 0$$

$$\boxed{\frac{dM}{dx} = -T(x)}$$

$$q(\xi) = q_{MAX} - \left(\frac{q_{MAX}}{l}\right) \cdot \xi$$

$$y = q - (m) \cdot x$$

$$0 < \xi < l = 500$$

• $N = H_B = 1250 N$

$$\frac{dT}{d\xi} = q(\xi) \quad dT = \left(q_{MAX} - \left(\frac{q_{MAX}}{l}\right) \xi \right) d\xi \quad T - T_0 = q_{MAX} \xi - \frac{q_{MAX} \xi^2}{2l}$$

→ NON CI SONO F. ESTERNE DI TAGLIO

• $T = q_{MAX} \xi - \frac{q_{MAX}}{2l} \xi^2$

$$\begin{cases} T(0) = 0 \\ T(l) = 2500 N \end{cases}$$

$$\frac{d^2 T}{d\xi^2} = -\frac{q_{MAX}}{l} < 0 \text{ CONCAVA} \quad T=0 \rightarrow \xi \left(q_{MAX} - \frac{q_{MAX}}{2l} \xi \right) = 0$$

$\xi = 2l$ FUORI INTERV.

TANGENTE ORIZZONTALE IN $\xi = 0$

$$\frac{dM}{d\xi} = -T(\xi) = -q_{MAX} \xi + \frac{q_{MAX}}{2l} \xi^2 \quad M - M_0 = -\frac{q_{MAX}}{2} \xi^2 + \frac{q_{MAX}}{6l} \xi^3$$

$M_0 = H_B$

• $M_B = M_B - \frac{q_{MAX}}{2} \xi^2 + \frac{q_{MAX}}{6l} \xi^3$

$$\begin{cases} M(0) = 766421.3562 Nmm \\ M(l) = -66311.9771 Nmm \end{cases}$$

$M=0$ in $\xi = 473.20$

$$\frac{d^2 M}{d\xi^2} = q_{MAX} - \frac{q_{MAX}}{2l} \xi$$

$$\frac{d^2 M}{d\xi^2} = -q_{MAX} + \frac{q_{MAX}}{l} \xi > \phi$$

$$+ \frac{\xi}{l} q_{MAX} = q_{MAX}$$

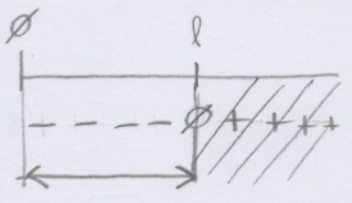
$$\boxed{\xi = l}$$

CAMBIO CONCAVITA' IN l (FLESSO)

$$\frac{q_{MAX}}{l} \cdot \xi > q_{MAX}$$

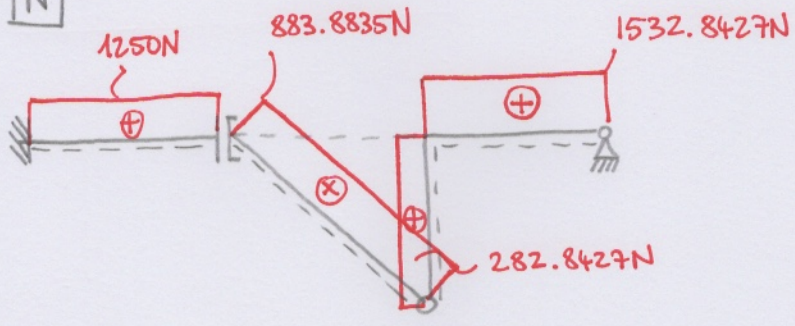
$$- \xi > l \Rightarrow \frac{d^2 M}{d\xi^2} > \phi$$

$$\xi < l \Rightarrow \frac{d^2 M}{d\xi^2} < \phi \rightarrow F. CONCAVA$$

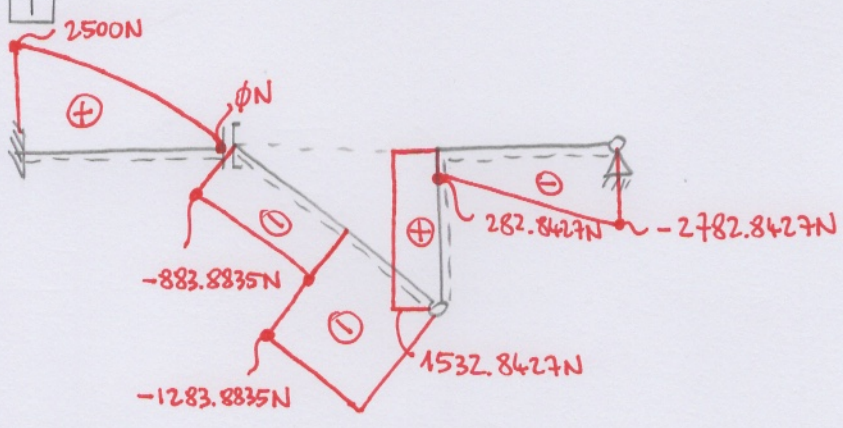


DIAGRAMMI

N



T



M

