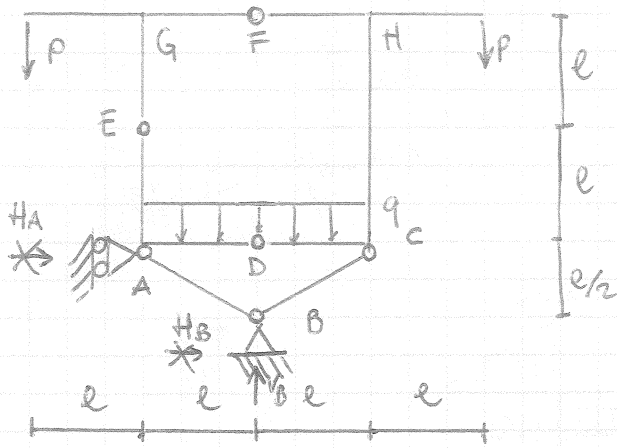


1)



$$q = 2000 \text{ N/m}$$

$$P = ql$$

$$l = 3 \text{ m}$$

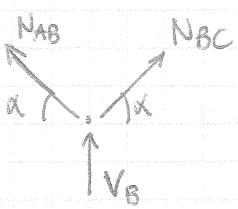
$$\tan \alpha = (1/2)$$

$$\uparrow) V_B - q \cdot 2l - 2ql = 0$$

$$V_B = 4ql$$

$$\uparrow) H_A \cdot l/2 - ql \cdot 2l + q \cdot 2l = 0 \quad H_A = H_B = 0$$

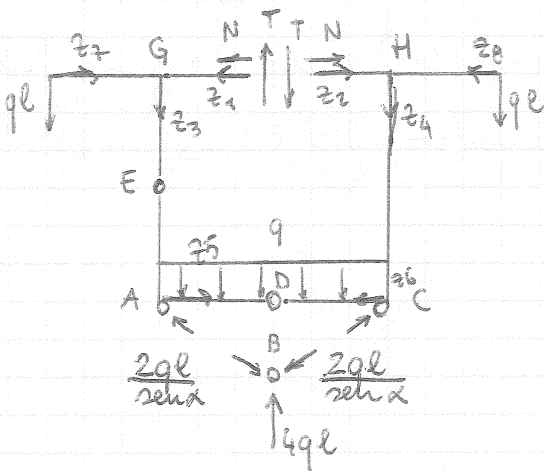
NODO B



$$\rightarrow) N_{BC} \cdot \cos \alpha - N_{AB} \cdot \cos \alpha = 0 \quad N_{BC} = N_{AB}$$

$$\uparrow) V_B + N_{AB} \cdot \sin \alpha + N_{BC} \cdot \sin \alpha = 0$$

$$N_{AB} = N_{BC} = -V_B / \sin \alpha = -4ql / \sin \alpha$$



$$\uparrow) 2ql^2 - 2ql^2 + \frac{ql^2}{2} + N \cdot 2l = 0$$

$$N = -\frac{ql^2}{4l} = -\frac{ql}{4}$$

E) AUXILIARIA EGF

$$ql \cdot l + N \cdot l + T \cdot l = 0$$

$$T = -\frac{3}{4}ql$$

$$N(z_8) = N(z_7) = 0$$

$$N(z_1) = N(z_2) = +\frac{ql}{4}$$

$$N(z_3) = -\frac{3}{4}ql - ql$$

$$N(z_4) = \frac{3}{4}ql - ql$$

$$N(z_5) = -\frac{ql}{4} + 2ql/\tan \alpha$$

$$N(z_6) = -\frac{ql}{4} + 2ql/\tan \alpha$$

$$T(z_8) = ql$$

$$T(z_7) = -ql$$

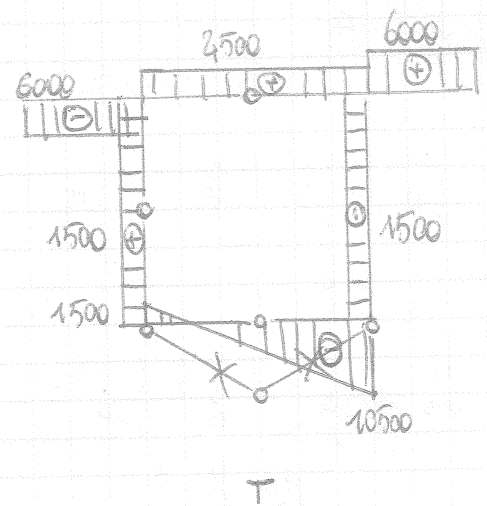
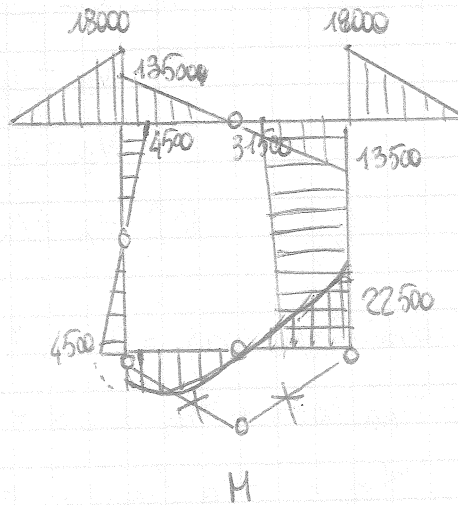
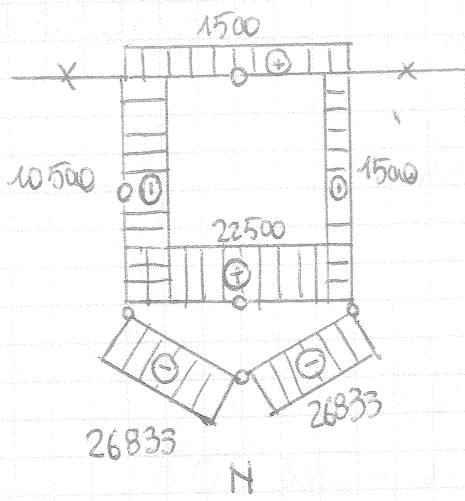
$$T(z_1) = T(z_2) = +\frac{3}{4}ql$$

$$T(z_3) = \frac{ql}{4}$$

$$T(z_4) = -\frac{ql}{4}$$

$$T(z_5) = -ql - \frac{3}{4}ql + 2ql - ql$$

$$T(z_6) = +ql - \frac{3}{4}ql - 2ql + ql$$



$$M(z_8) = M(z_7) = -qlz$$

$$M(z_1) = -\frac{3}{4}qlz$$

$$M(z_2) = \frac{3}{4}qlz$$

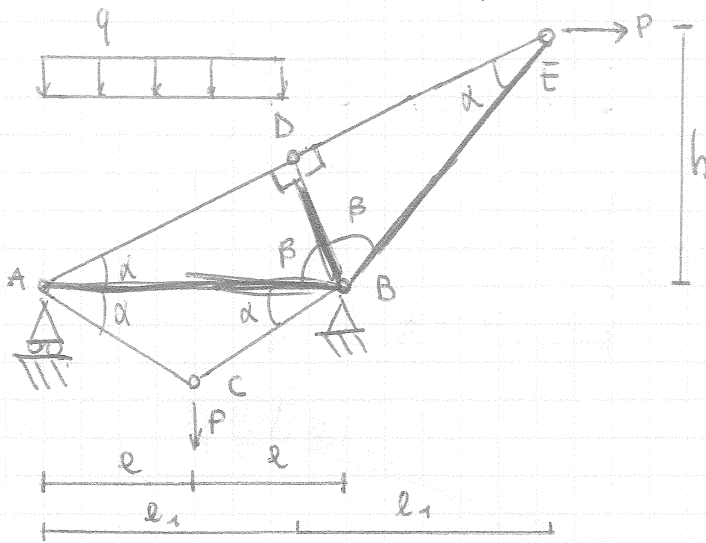
$$M(z_3) = -ql^2 + \frac{3}{4}ql^2 + \frac{qlz}{4}$$

$$M(z_4) = -ql^2 - \frac{3}{4}ql^2 + \frac{qlz}{4}$$

$$M(z_5) = -ql(l+z) + \frac{3}{4}ql(l-z) + \frac{ql^2}{2} - \frac{qz^2}{2} + 2qlz$$

$$M(z_6) = -ql(l+z) - \frac{3}{4}ql(l-z) + \frac{ql^2}{2} - \frac{qz^2}{2} + 2qlz$$

2)



$$q = 2000 \text{ N/m}$$

$$P = ql$$

$$l = 2 \text{ m}$$

$$\alpha = 30^\circ$$

$$\beta = 60^\circ$$

$$AD = AB \cdot \cos \alpha = l\sqrt{3} = DE$$

$$l_1 = DE \cdot \cos \alpha = \frac{3}{2}l$$

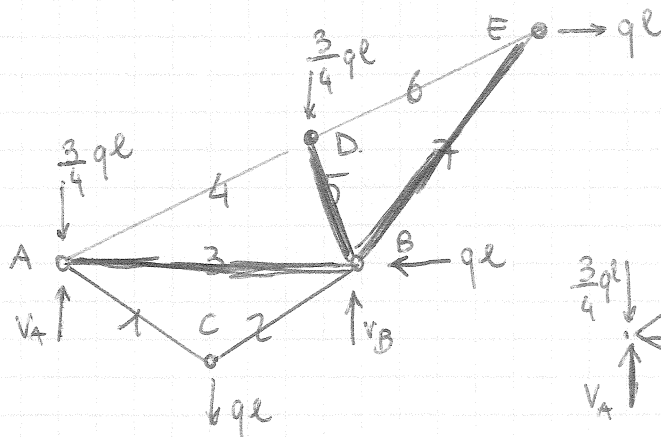
$$h = 2AD \cdot \sin \alpha = 2l\sqrt{3} \cdot \sin \alpha = l\sqrt{3}$$

$$\rightarrow H_B = -ql$$

$$A \uparrow V_B \cdot 2l - \frac{q}{2} \left( \frac{3l}{2} \right)^2 - ql^2 - ql \cdot l\sqrt{3} = 0 \quad V_B = \frac{17 + 8\sqrt{3}}{16} ql$$

$$\uparrow V_A + V_B - q \frac{3}{2}l - ql = 0 \quad V_A = \left( \frac{23}{16} - \frac{8\sqrt{3}}{16} \right) ql$$

STATO PRIMARIO



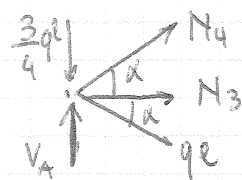
NODO C



$$\rightarrow N_1 = N_2$$

$$\uparrow N_1 = N_2 = \frac{ql}{2 \cos \alpha} = ql$$

NODO A



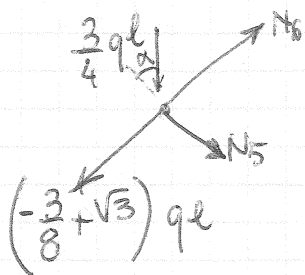
$$\uparrow N_4 \sin \alpha - ql \sin \alpha - \frac{3}{4}ql + V_A = 0$$

$$N_4 = -\frac{3}{8}ql + \sqrt{3}ql$$

$$\rightarrow ql \cos \alpha + N_3 + N_4 \cos \alpha = 0$$

$$N_3 = \left( -\frac{5\sqrt{3}}{16} - \frac{3}{2} \right) ql$$

NODO D



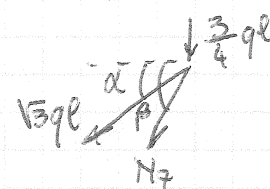
$$\uparrow - \left( -\frac{3}{8} + \sqrt{3} \right) ql + N_6 - \frac{3}{4}ql \sin \alpha = 0$$

$$N_6 = \sqrt{3}ql$$

$$\rightarrow N_5 + \frac{3}{4}ql \cos \alpha = 0$$

$$N_5 = -\frac{3\sqrt{3}}{8}ql$$

NODO E



$$\rightarrow -\sqrt{3}ql \cos \alpha - N_7 \cos \beta = 0$$

$$N_7 = -ql$$

| m | N                                                    | [N]   |
|---|------------------------------------------------------|-------|
| 1 | $ql$                                                 | 4000  |
| 2 | $ql$                                                 | 4000  |
| 3 | $-\left(\frac{5\sqrt{3}}{16} + \frac{3}{2}\right)ql$ | -8165 |
| 4 | $\left(\sqrt{3} + \frac{3}{8}\right)ql$              | 5428  |
| 5 | $-\frac{3\sqrt{3}}{8}ql$                             | -2598 |
| 6 | $\sqrt{3}ql$                                         | 6928  |
| 7 | $-ql$                                                | -4000 |

## STATO SECONDARIO

