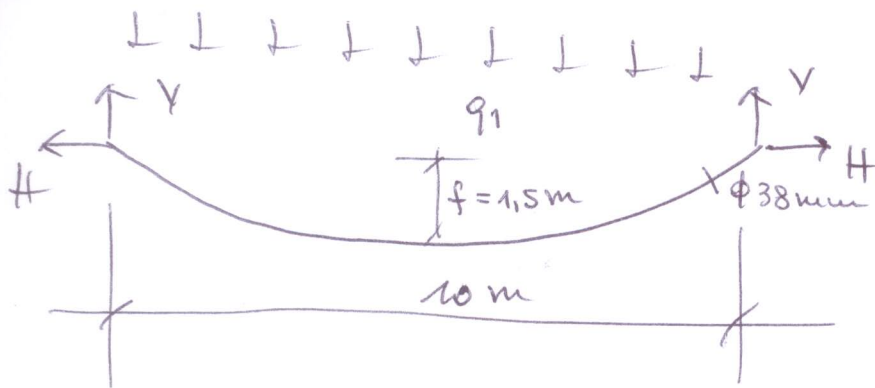


Es. 2



$$H = \frac{q_1 l^2}{8f} = 50'000 \text{ N}$$

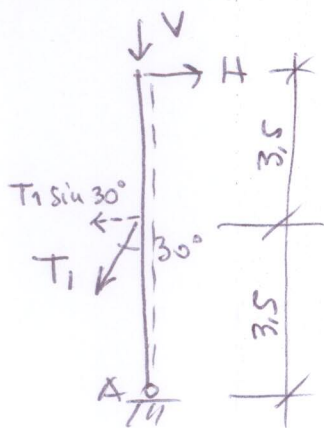
$$V = q_1 \frac{l}{2} = 30'000 \text{ N}$$

$$T_{max} = \sqrt{H^2 + V^2} = 58309 \text{ N}$$

$$A_{\phi 38} = 1,13 \cdot 10^{-3} \text{ m}^2$$

$$\sigma_{max \text{ fine}} = 51,41 \text{ MPa}$$

Pilastro AEG

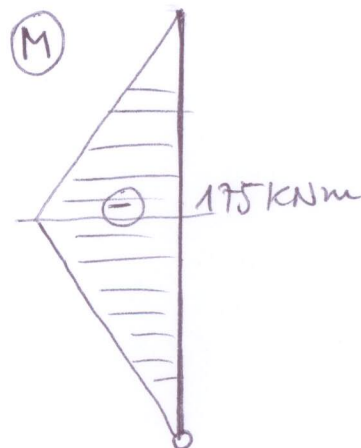
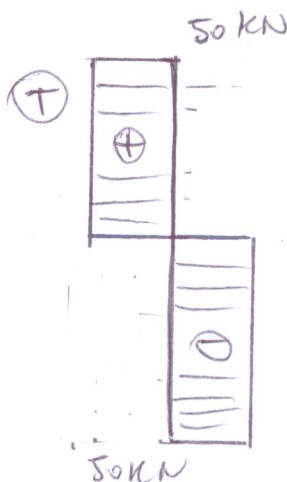
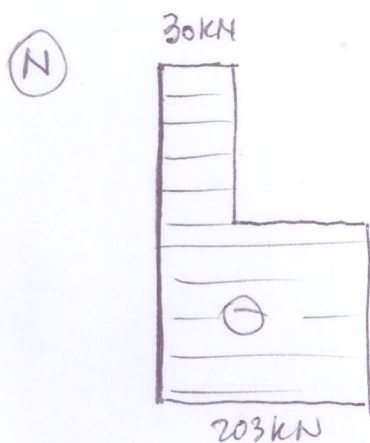


$$M_A = 0: H \cdot 7 - T_1 \sin 30^\circ \cdot 3,5 = 0$$

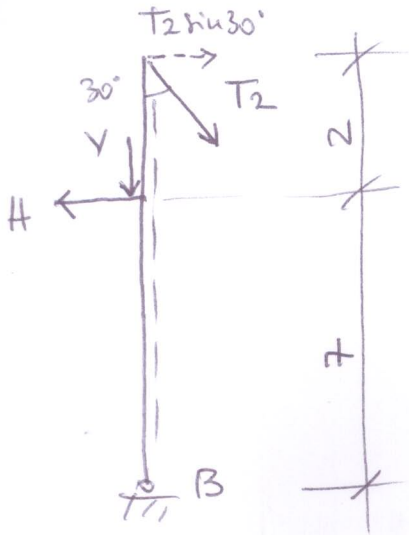
$$T_1 = 200'000 \text{ N}$$

$$T_1 \cos 30^\circ = 173205 \text{ N}$$

$$T_1 \sin 30^\circ = 100'000 \text{ N}$$



Pilastro BFI

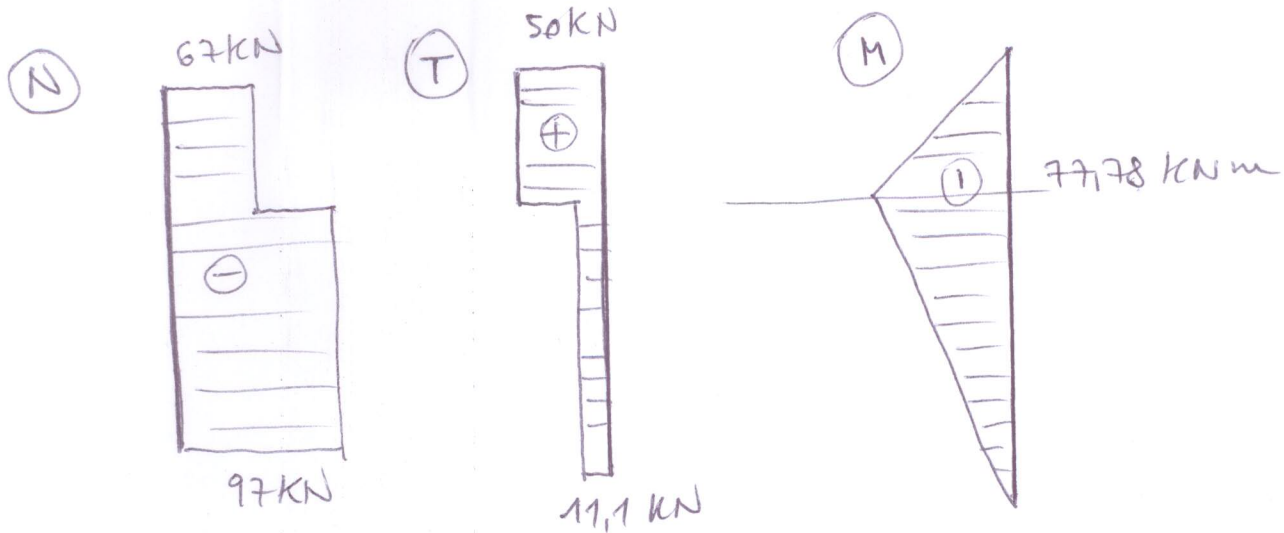


$$M_B = 0 : -H \cdot 7 + T_2 \sin 30^\circ \cdot 9 = 0$$

$$T_2 = 77.777 \text{ N}$$

$$T_2 \sin 30^\circ = 38889 \text{ N}$$

$$T_2 \cos 30^\circ = 67357 \text{ N}$$



Tensioni nelle funi ED, IC

$$\underline{ED} \quad \sigma_1 = \frac{T_1}{A_{\phi 30}} = \frac{200'000}{7,06 \cdot 10^{-4}} = 282,9 \text{ MPa}$$

$$\underline{IC} \quad \sigma_2 = \frac{T_2}{A_{\phi 30}} = \frac{77777}{7,06 \cdot 10^{-4}} = 110,2 \text{ MPa}$$

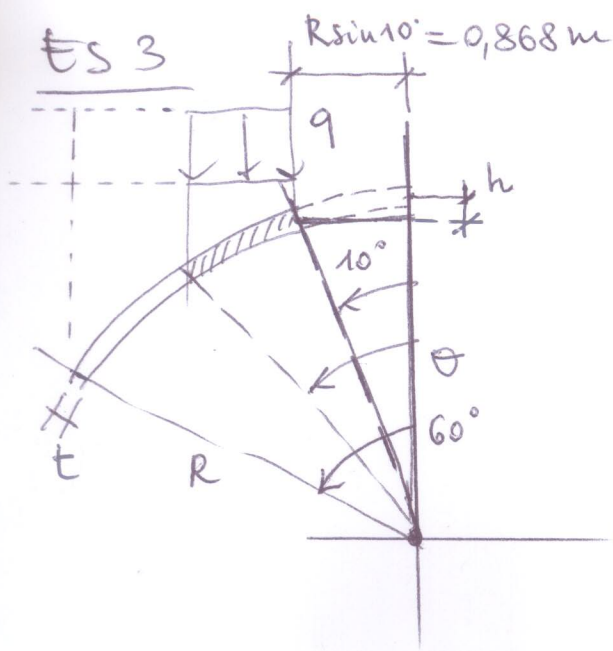
Allungamento nel cavo

$$N_{cavo} \simeq H \quad \Delta L = \frac{HL}{EA_{\phi 38}} = \frac{50'000 \cdot 10,6}{2,1 \cdot 10^{11} \cdot 1,13 \cdot 10^{-3}} = 2,23 \text{ mm}$$

$$L = l + \frac{8f^2}{3l} = 10 + 0,6 = 10,6 \text{ m}$$

$$f' = \sqrt{\frac{(L + \Delta L - l) 3l}{0}} = 1,503 \text{ m}$$

Es 3



$$Q_q(\theta) = [(R \sin \theta)^2 - (R \sin 10^\circ)^2] \cdot \pi \cdot q$$

$$S(\theta) = 2\pi R^2 (1 - \cos \theta) - 2\pi R^2 (1 - \cos 10^\circ)$$

$$= 2\pi R^2 (1 - \cos \theta - 0,0152)$$

$$Q_p(\theta) = S(\theta) \cdot t \cdot \gamma$$

$$= 2\pi R^2 (1 - \cos \theta - 0,0152) \cdot t \cdot \gamma$$

$$Q_{TOT} = Q_q + Q_p$$

$\theta_{min} = 10^\circ$
 $\theta_{max} = 60^\circ$

$$n_x = \frac{-Q_{TOT}(\theta)}{2\pi R \sin^2 \theta}; \quad \frac{n_x}{R} + \frac{n_y}{R} = -p_z$$

$$p_z = (\gamma t \cos \theta + q \cos^2 \theta)$$

$\theta = 10^\circ$ $n_x = 0$

$\sigma_x = 0$

$n_y = R \left(-p_z - \frac{n_x}{R} \right) = -66219 \text{ N/m}$ $\sigma_y = \frac{n_y}{t} = -0,37 \text{ MPa}$
 verificato

$\theta = 60^\circ$ $n_x = -35630 \text{ N/m}$

$\sigma_x = -0,198 \text{ MPa}$
 verificato

$n_y = +14128 \text{ N/m}$ $\sigma_y = +0,08 \text{ MPa}$
 verificato