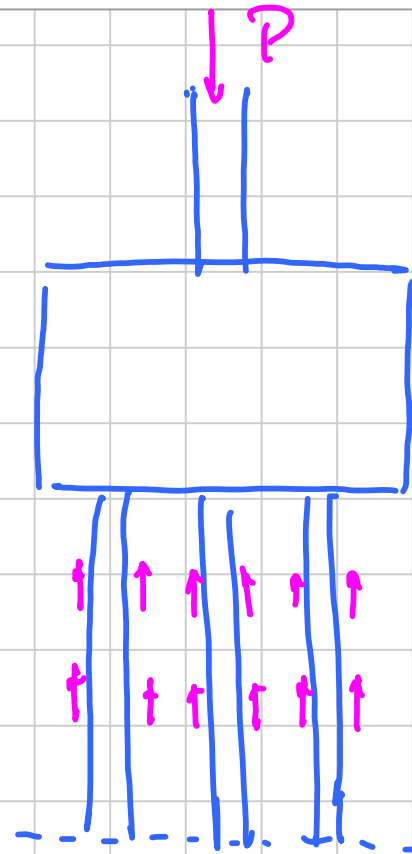
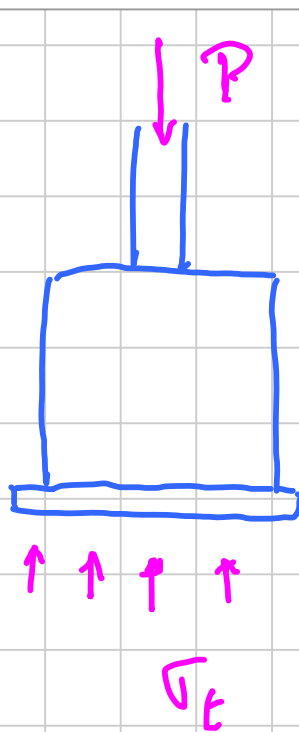
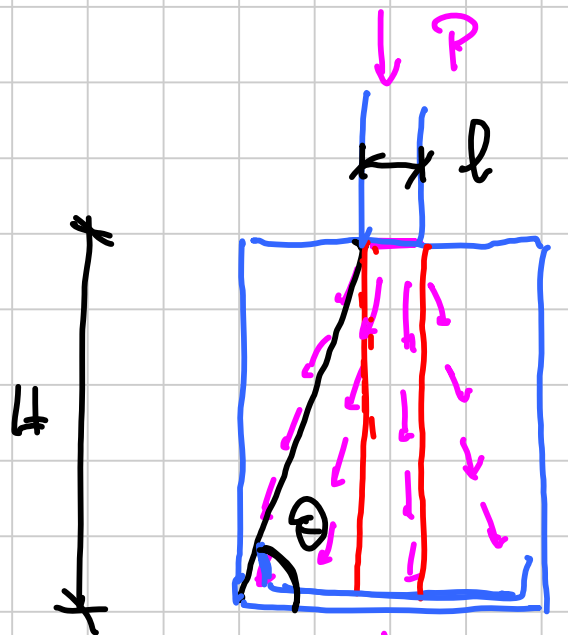


PLINTI

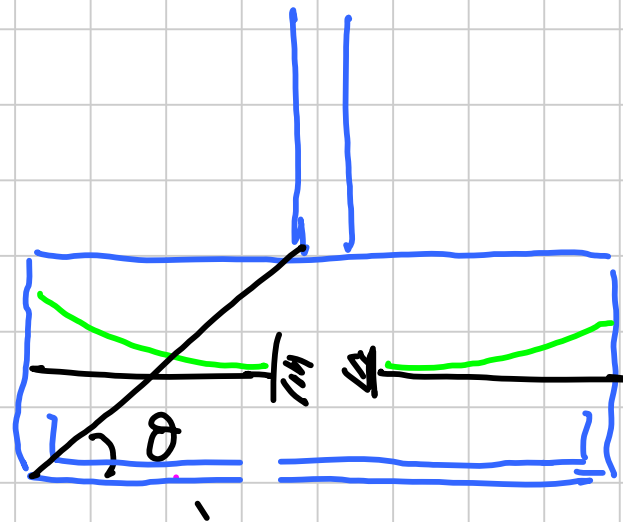
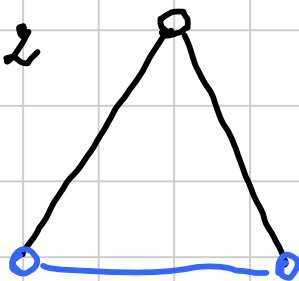
Titolo nota

29/05/2015





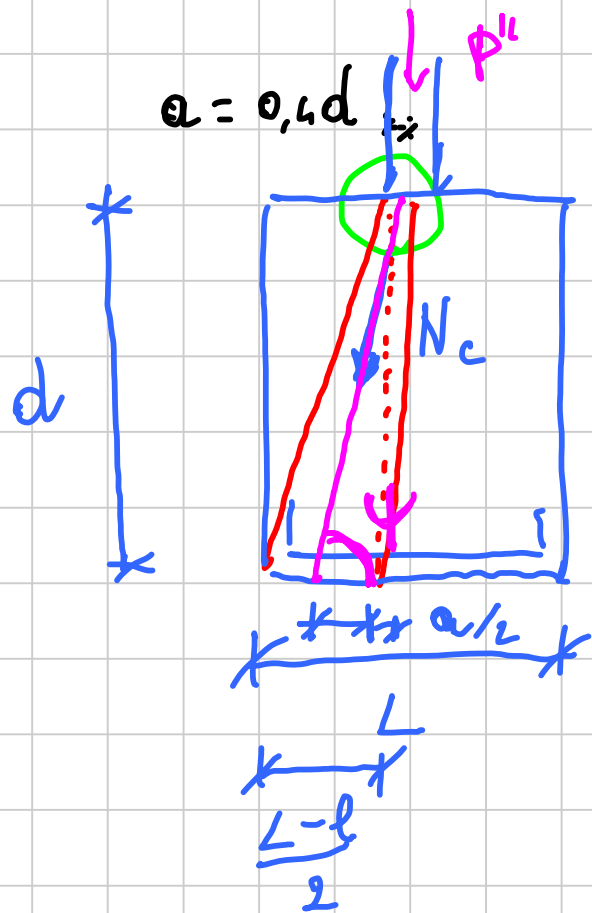
$$\frac{L-l}{2}$$



$$\Theta = \arctan\left(\frac{2H}{L-l}\right)$$

$$\Theta \geq 60^\circ \text{ for } A_0$$

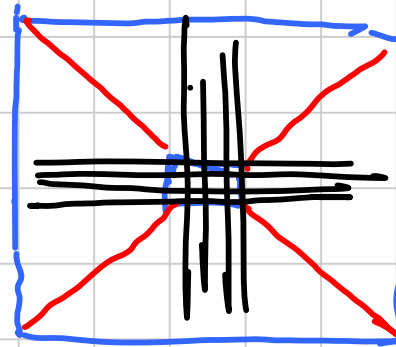
$$\Theta \leq 25^\circ \text{ small}$$



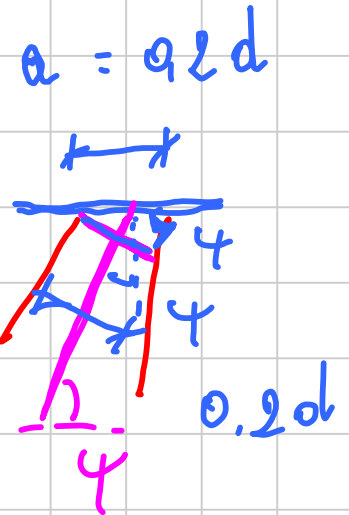
$B \times L$

$b \times l$

$$P' = P \frac{bl}{BL}$$



$$P'' = \frac{P - P'}{2}$$



$$h_e = \frac{L-l}{2} + \frac{a}{2}$$

$$a \leq \frac{h}{2}$$

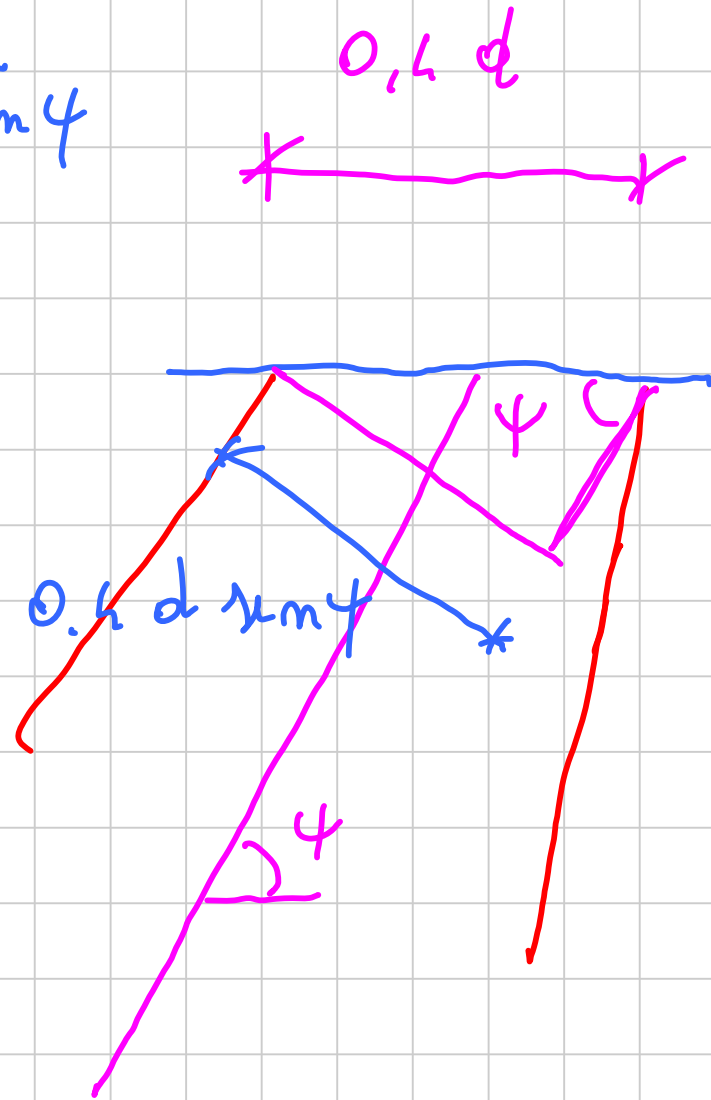
$$\gamma = \arctan\left(\frac{a}{h_e}\right)$$

$$\frac{P''}{2} = N_{\text{cm}} \Rightarrow N = \frac{P''}{2 \text{ cm}}$$

$$N_{\text{Rd,c}} = 0,4 \text{ bd cm} \text{ fed}$$

$$\frac{P''_{\text{Rd,c}}}{2 \text{ cm}} = 0,4 \text{ bd cm} \text{ fed}$$

$$P''_{\text{Rd,c}} = 2 \left(0,4 \text{ bd } \frac{\text{cm}^2}{1} \text{ fed} \right)$$



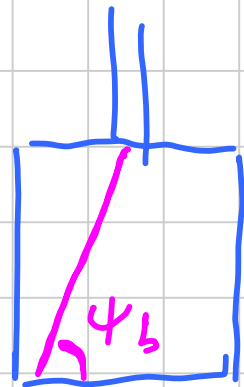
$$P''_{Rd,c} = 2 \left(0.4 b d f_{cd} \frac{\mu_m^2}{\mu_m^2 + \cot^2 \varphi} \right)$$

$$P^I_{Rd,c} = 2 \left(0.4 b d f_{cd} \frac{1}{1 + \cot^2 \varphi} \right)$$

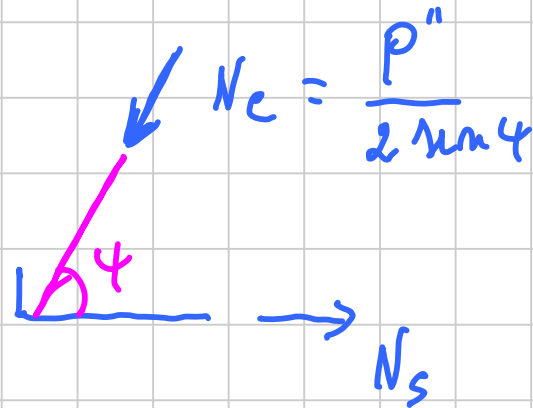
$$\lambda = \cot \varphi = \frac{l_a}{d}$$

$$P''_{Rd,L} = 2 \left(0.4 b d f_{cd} \frac{1}{1 + \lambda^2} \right)$$

$$P'''_{Rd,c} = 2 \left(0.4 b d f_{cd} \frac{1}{1 + \lambda_b^2} \right)$$



$$P_{Rd,c} = P^I + P_{Rd,c}'' + P_{Rd,c}''' \geq P$$



A diagram showing a force vector N_c acting at an angle ϕ to a horizontal surface. The horizontal component of the force is labeled N_s .

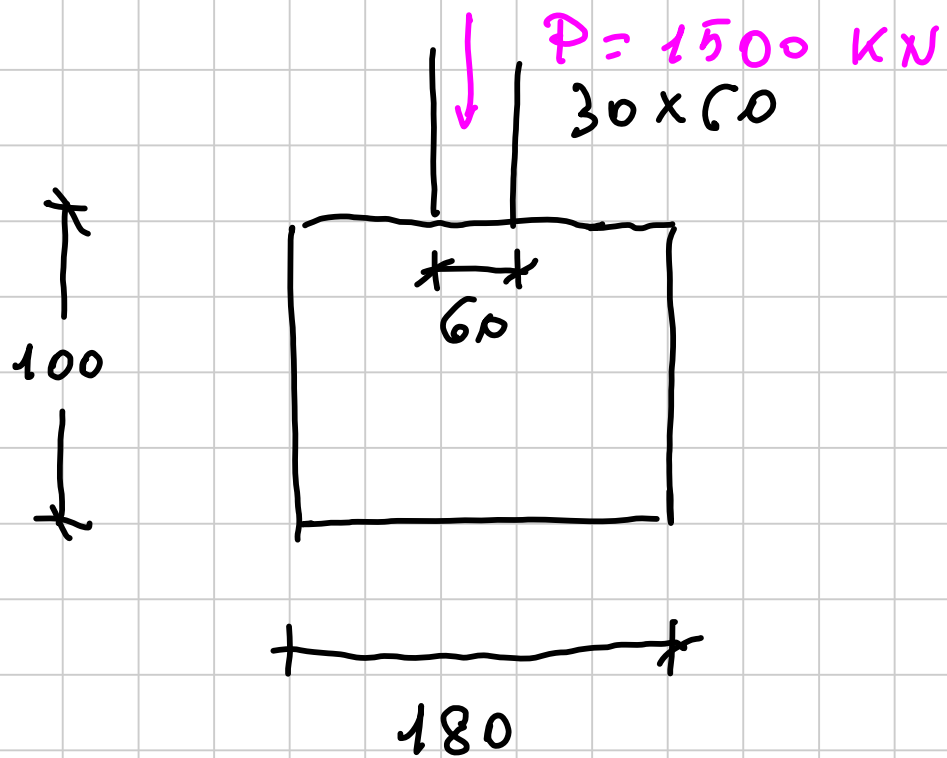
$$N_c = \frac{P''}{2 \sin \phi}$$

$$N_s = N_c \cos \phi = \frac{P''}{2} \cot \phi = \frac{P''}{2} \lambda$$

$$N_s = \frac{P_{Rd,s}'' \lambda}{2} = A_s f_{yd}$$

$$P_{Rd,s,l}'' = \frac{2 A_{s,l} f_{yd}}{\lambda_l}$$

$$P_{Rd,s,b}'' = \frac{2 A_{s,b} f_{yd}}{\lambda_b}$$



$$\Theta = \arctan\left(\frac{2H}{L-l}\right)$$

$$= \arctan\left(\frac{2 \times 100}{180 - 60}\right)$$

$$= 59^\circ$$

$$P' = P \times \frac{b l}{B L} = 1500 \times \frac{30 \times 60}{180 \times 180} = 83 \text{ KN}$$

$$P'' =$$

$$\lambda_e = \cot \psi_e$$

$$\psi_e = \arctan \frac{d}{l_a}$$

$$d = 100 - 5 = 95 \text{ mm}$$

$$l_a = \frac{L - l}{4} + 0,2 d \leq \frac{l}{4} = 15$$



$$l_a = \frac{L - l}{4} + \frac{l}{4} = \frac{180 - 60}{4} + \frac{60}{4} = 45 \text{ cm}$$

$$\psi_1 = \arctan\left(\frac{95}{45}\right) = 64.6^\circ$$

$$\lambda_1 = \cotg \psi_1 = \cotg 64.6 = 0.48$$

$$P_{R1}'' = 2 \times 0.4 \times 30 \times 95 \times 14.2 \times \frac{1}{1 + 0.48^2} \times \frac{1}{10} = 2632 \text{ kN}$$

$$b_a = \frac{B-b}{4} + \frac{b}{4} = \frac{180-30}{4} + \frac{30}{4} = 45 \text{ cm}$$

$$\psi_b = \arctan\left(\frac{d}{b_a}\right) = 64.7^\circ$$

$$\lambda_b = \cot \psi_b = 0.48$$

$$P_{ed}^{II} = 2 \left(0.4 \cdot d \cdot f_{cd} \cdot \frac{1}{1 + \lambda_b^2} \right)$$

$$= 2 \times 0.4 \times 60 \times 95 \times 14.2 \cdot \frac{1}{1 + 0.48^2} \cdot \frac{1}{40} = 5263 \text{ kN}$$

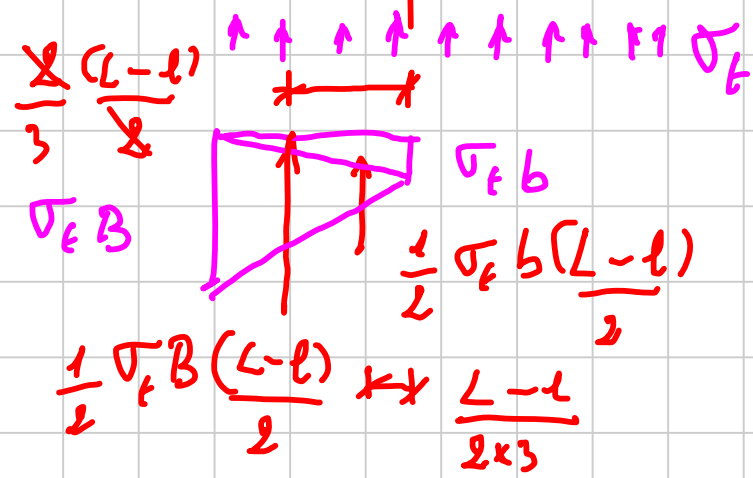
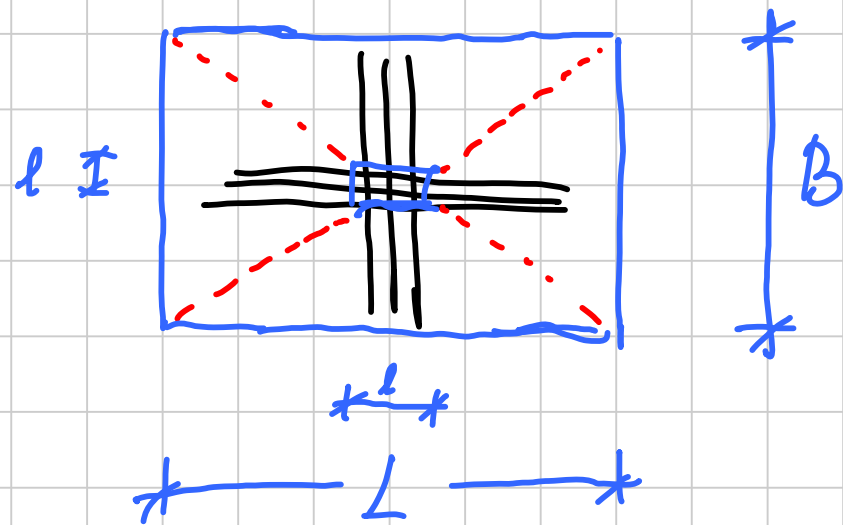
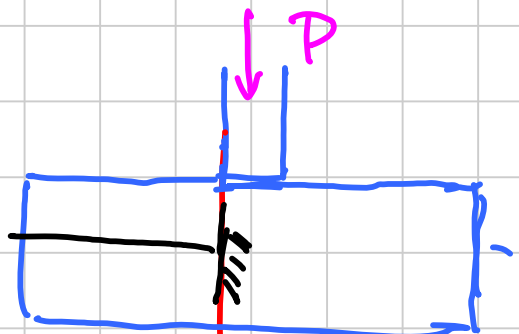
$$P_{Rd,c} = 83 + 2632 + 5263 = 7978 \text{ kN} > 1500 \text{ kN}$$

$$P_{Rd,s.l}'' = \frac{2 A_{s,l} f_{yd}}{\lambda} = P''$$

$$A_{s,l} = \frac{P'' \lambda_l}{2 f_{yd}} = \frac{708.5 \times 0.48 \times 10}{2 \times 391.3} = 4.3 \text{ cm}^2$$

$$P'' = \frac{P - P'}{2} = \frac{1500 - 83}{2} = 708.5 \text{ kN}$$

$$A_{s,b} = \frac{P'' \lambda_b}{2 f_{yd}} = 4.3 \text{ cm}^2$$



$$\sigma_f = \frac{P}{BL}$$

$$M_{Ed} = \frac{1}{2} \sigma_f B \frac{(L-l)}{2} \frac{(L-l)}{3} + \frac{1}{2} \sigma_f b \frac{(L-l)}{2} \frac{(L-l)}{6}$$

$$M_{Ed} = \sigma_f B \frac{(L-l)^2}{12} + \frac{1}{2} \sigma_f b \frac{(L-l)^2}{12}$$

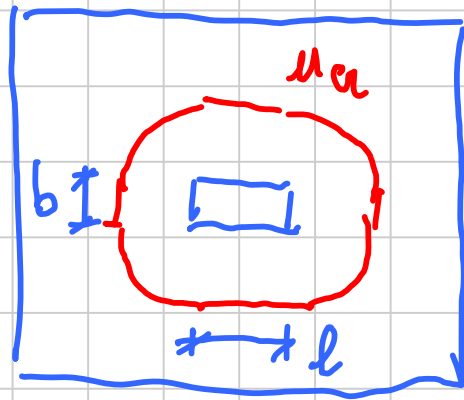
$$= \sigma_f \left(B + \frac{b}{2} \right) \frac{(L-l)^2}{12} \frac{BL}{BL}$$

$$= \frac{P}{12} \left(1 + \frac{b}{2B} \right) \frac{(L-l)^2}{L} \leq M_{Ra} = \frac{b d^2}{7.2}$$

$$A_s = \frac{M_{Ed}}{0.9 d f_{yd}}$$

$$M_{Ed} = \frac{P}{12} \left(1 + \frac{l}{2L} \right) \frac{(B-b)^2}{B} \leq M_{Rd,c} = \frac{l d^2}{\gamma'}$$

$$A_s = \frac{M_{Ed}}{0.9 d f_{yd}}$$



$2l$

$2ol$

$$u_c = 2b + 2l + 4\pi d$$

$$N_{Ed} = \frac{P}{u_c d} \leq N_{Rd,c}$$

$$M_{Ed} = \frac{P}{12} \left(1 + \frac{b}{2a} \right) \frac{(L-l)^2}{L}$$

$$= \frac{1500}{12} \times \left(1 + \frac{30}{2 \times 180} \right) \times \frac{(180 - 60)^2}{180} \times \frac{1}{10^3} = 108,3 \text{ kNm}$$

$$M_{Ed,c} = \frac{b d^2}{2'2} = \frac{0,3 \times 0,45^2}{0,018^2} = 835 \text{ kNm}$$

$$A_s = \frac{M_{Ed}}{0,9 d f_{yd}} = \frac{108,3 \times 10}{0,9 \times 0,45 \times 391,3} = 3,2 \text{ cm}^2$$

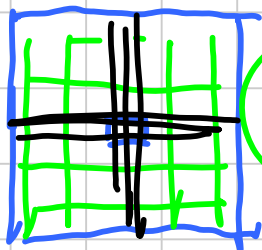
$$M_{Ed} = \frac{P}{12} \left(1 + \frac{l}{2L}\right) \frac{(B-b)^2}{B}$$

$$= \frac{1500}{12} \times \left(1 + \frac{60}{2 \times 180}\right) \frac{(180 - 30)^2}{180} \frac{1}{10^2} = 180 \text{ kNm}$$

$$M_{Rd} = \frac{f d^2}{\gamma'_{sc}} = \frac{0.6 \times 0.95^2}{0.018^2} = 1671 \text{ kNm}$$

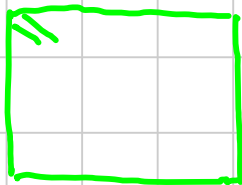
$$A_s = \frac{M_{Ed}}{0.9 d f_{yk}} = \frac{180 \times 10}{0.9 \times 0.95 \times 391.3} = 5.6 \text{ cm}^2$$

$\phi 14/25$

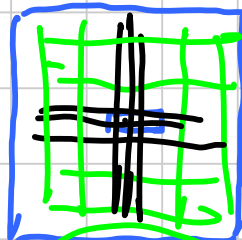
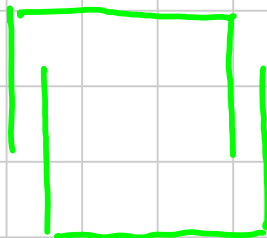


4,3 cm²

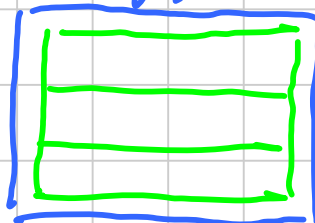
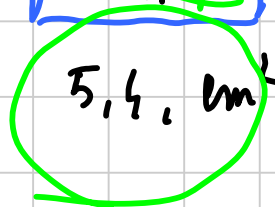
4,3 cm²



определить

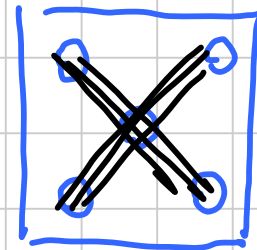
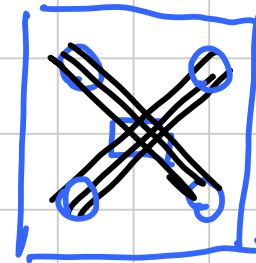
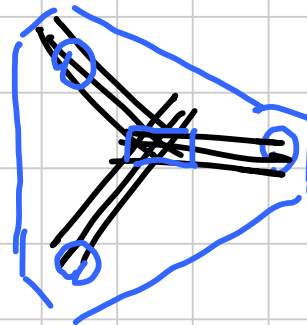
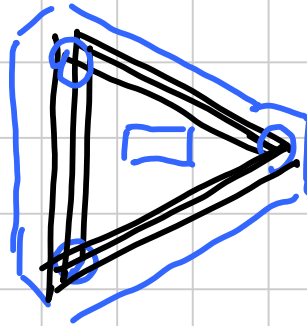
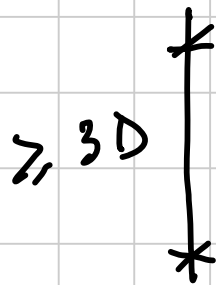
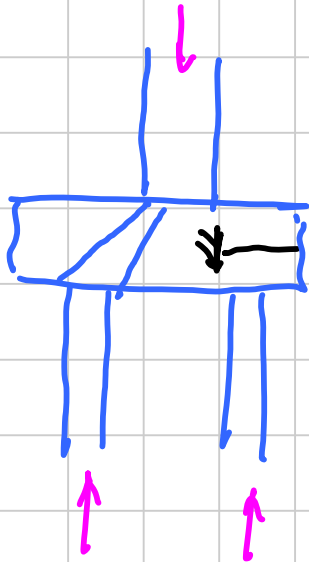


3,2 cm²



$I \leq 25 \text{ cm}$

PLINTI SU PALI



Verifica delle tensioni in esercizio

Combinazione di
carico

limiti: sulle
tensioni

RARA

$$\sigma_c \leq 0.6 f_{ck}$$

$$\sigma_s \leq 0.8 f_{yk}$$

QUASI

PERMANENTE

$$\sigma_c \leq 0.45 f_{ck}$$