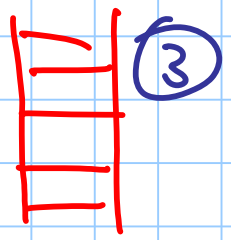
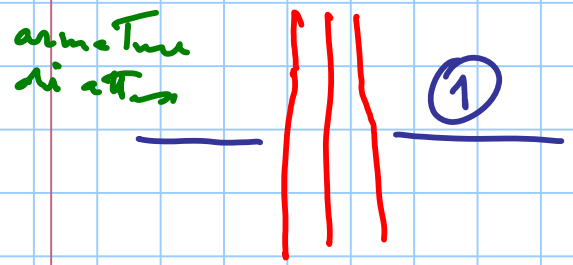
PILASTRI

Titolo nota 26/03/2015

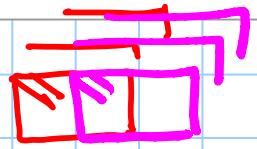
realizzazione

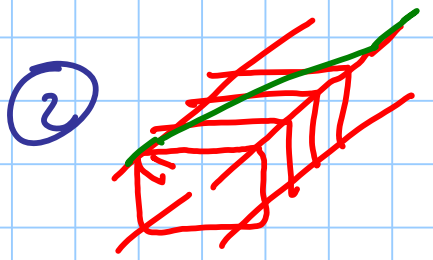




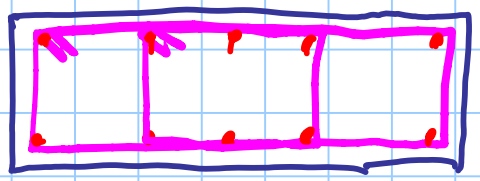
piano già completato

pilastro sottostante



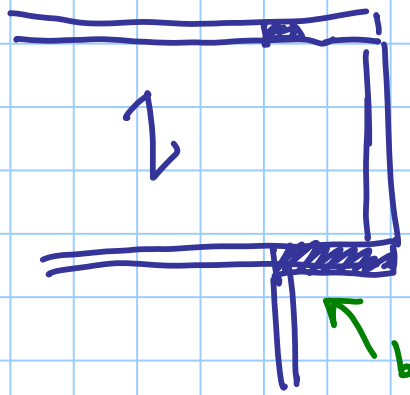


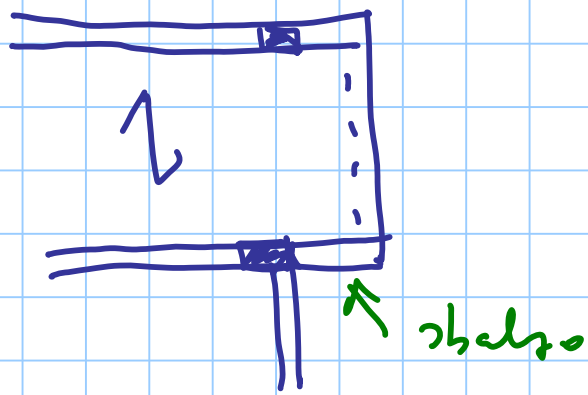
bene disegnare aggiunte per evitare deformazioni della scala

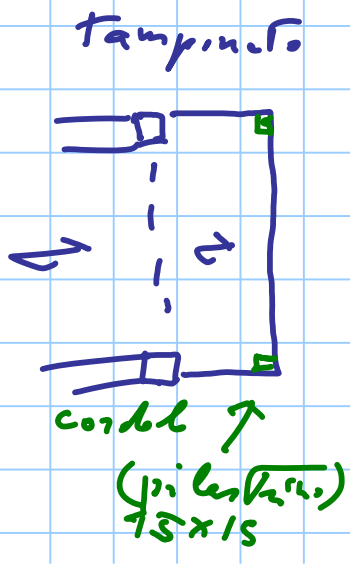


INNESTI A BAIONETTA

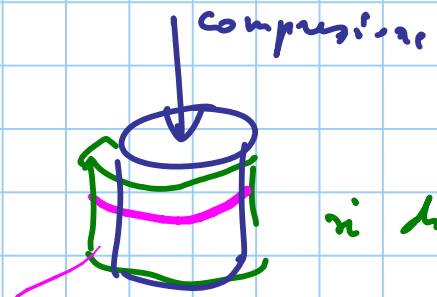
possibili, ma meglio evitarli





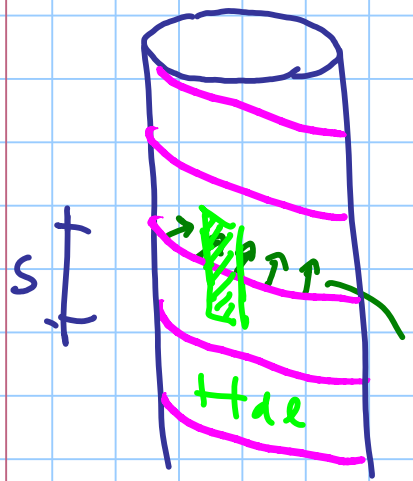


INFLUENZA DELLE STAFFE SULLA RESISTENZA

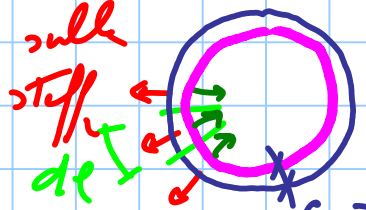


si dilata

le staffe contrastano la dilatazione



spirale

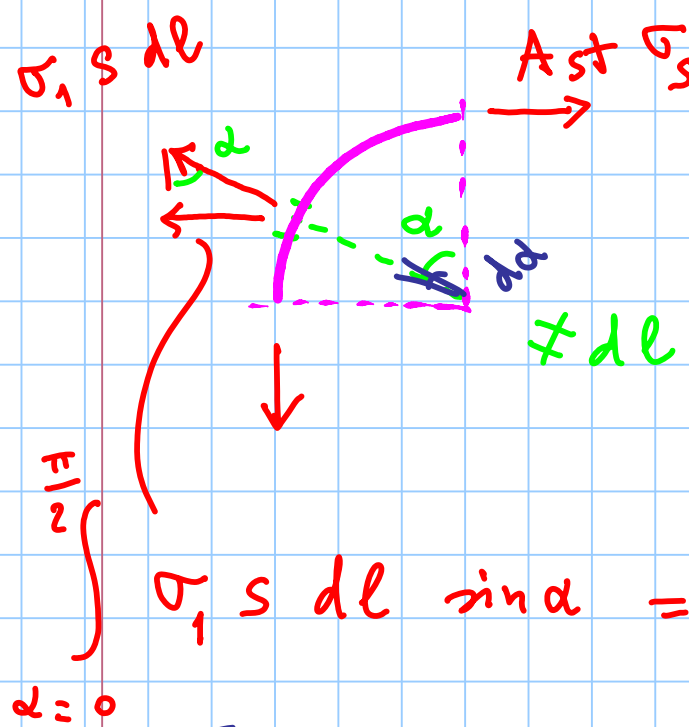


r = raggio della sezione

r_c = raggio della parte confinata

compressione Trasversale sulla parte confinata

A_{st} = area staffe



σ_1 tensione di compressione trasversale

$$dl = r_0\, d\alpha$$

$$\int_{\alpha=0}^{\pi/2} \sigma_1\, s\, dl \sin\alpha = A_{st}\,\sigma_s$$

$$\int_{\alpha=0}^{\pi/2} \sigma_1\, s\, r_0 \sin\alpha\, d\alpha = A_{st}\,\sigma_s$$

$$\sigma_1\, s\, r_0 \int_0^{\pi/2} \sin\alpha\, d\alpha$$

$$\left| -\cos\alpha \right|_0^{\pi/2} = \left(-\cos\tfrac{\pi}{2}\right) - \left(-\cos 0\right)$$

$$\sigma_1 \, s \, r_0 = A_{st} \, \sigma_s$$

$$\sigma_1 = \frac{A_{st}}{s \, r_0} \, \sigma_s \qquad \text{SLU} \qquad \sigma_1^{max} = \frac{A_{st}}{s \, r_0} \, f_{y1}$$

$$\rho_{st} = \frac{A_{st} \, 2\pi r_0}{\pi r_0^2 \, s} = 2 \, \frac{A_{st}}{s \, r_0}$$

rapporto volumetrico di staffa

$$\sigma_1 = 0.5 \, \rho_{st} \, \sigma_s \qquad \sigma_1^{max} = 0.5 \, \rho_{st} \, f_{y1}$$

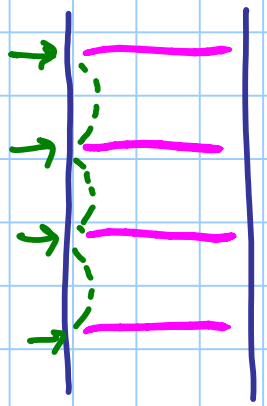
$$\omega_{st} = \rho_{st} \frac{f_{yd}}{f_{cd}}$$

$$\frac{\text{volume acciaio} \times \text{resist. acciaio}}{\text{volume cls} \times \text{resist. cls}}$$

rapporto meccanico di staffe

(rapporto volumetrico × rapporto di resistenza)

$$\sigma_1^{max} = 0.5\ \omega_{st}\ f_{cd}$$

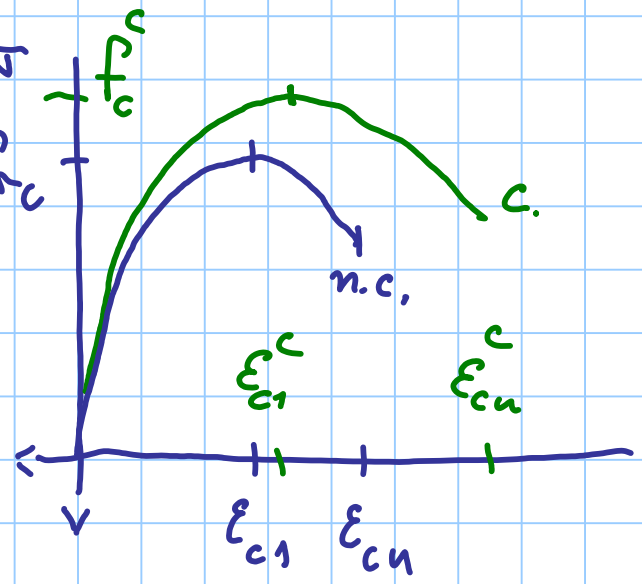


coefficiente di efficacia

$$\alpha = \frac{\text{volume di cls realmente confinato}}{\text{volume totale}} \leq 1$$

$$\sigma_1^{max} = 0.5\ \alpha\ \omega_{st}\ f_{cd}$$

legame costitutivo del calcestruzzo



$$f_c^c = k f_c \qquad k \geq 1$$

$$= f_c + t\,\sigma_1 \qquad t \geq 0$$

$$\Delta f_c = t\,\sigma_1 =$$

per $\sigma_1 \leq 0.05 f_c \quad = 5.0\,\sigma_1$

per $\sigma_1 > 0.05 f_c \quad = 0.25 f_c + 2.5\,(\sigma_1 - 0.05 f_c)$

n.c. = non confinato

c. = confinato

$$N_{Rd} = A_c^c \left(f_{cd} + t\sigma_1 \right) + A_{s,tot} f_{yd} =$$

$$= A_c^c f_{cd} + \underbrace{A_c^c t \sigma_1}_{\text{contr. confinem.}} + A_{s,tot} f_{yd}$$

$$\Downarrow$$

$$A_c^c \; t \; 0.5 \; \alpha \underbrace{w_{st} f_{cd}}_{\rho_{st} f_{yd}}$$

$$\rho_{st} = \frac{\text{vol. effetto}}{\text{vol. cls}}$$

vol. effetto $\quad A_{st}\ 2\pi r_0 \quad$ in un concio alto s

$$A_{l,eq}\ s = A_{st}\ 2\pi r_0$$

$$A_{l,eq} = \frac{A_{st}\ 2\pi r_0}{s}$$

$$\rho_{st} = \frac{A_{l,eq}\ \cancel{s}}{\pi r_0^2\ \cancel{s}}$$

contributo staffe

$$A_c^c \, \frac{t}{2} \, \rho_{st} \, f_{yd} = A_{l,eq} \, \frac{t}{2} \, f_{yd}$$

$A_c^c \downarrow \pi r_0^2$

$\rho_{st} \downarrow \dfrac{A_{l,eq}}{\pi r_0^2}$

$$N_{Rd} = A_c^c \, f_{cd} + A_{l,eq} \left(\frac{t}{2}\right) f_{yd} + A_{s,tot} \, f_{yd}$$

$\frac{t}{2}$:
- nel passato 2
- oggi 1

CARPENTERIA

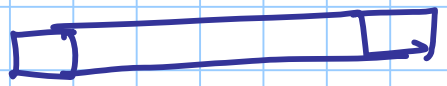
pilastri — per ora 30×60

poi dimensioni massime (1° ordine)

punti fissi

numerare i pilastri

Travi emergenti



Travi a spessore

momento

(per ora linea d'asse tratteggiata più spessa)