

In presenza di armature inclinata di α ($\alpha = 50^\circ \rightarrow 5/8$
 $\alpha = 45^\circ \rightarrow 10/8$)

$$V_{Rd,s} = \frac{A_{sw}}{s} \geq f_{yd} \sin \alpha (\cot \theta + \cot \alpha)$$

per sole staffe

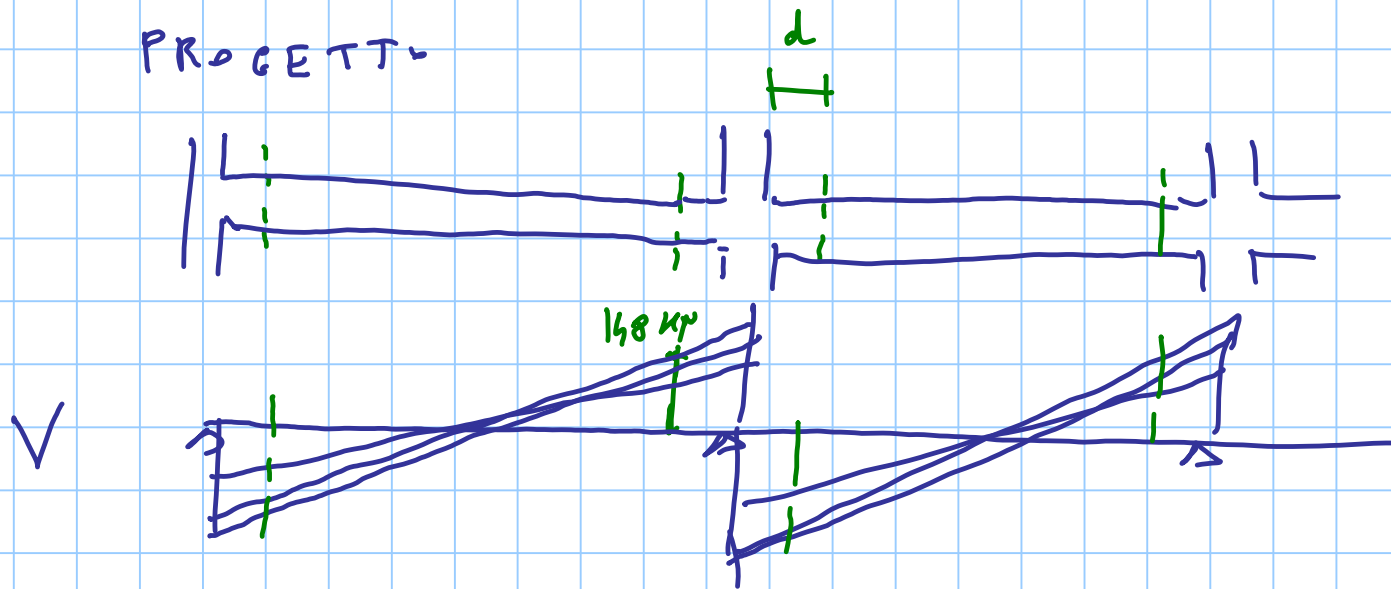
$$V_{Rd,s} = \frac{A_{st}}{s} \geq f_{yd} \cot \theta$$

da

$$V_{Rd,max} = 0.5 f_{cd} b \geq \frac{\cot \theta + \cancel{\cot \alpha}}{1 + \cot^2 \theta}$$

da considerare
solo le staffe
inclinate

PROGETTO



20.75 m

30 x 50

$c = 4 \text{ cm}$

$d = 46 \text{ cm}$

$$V_{Ed} = 148 \text{ kN}$$

$$\cot \theta \text{ da: } V_{Ed} = V_{Rd, \max}$$

prova prima con $\cot \theta = 2$ e calcol $V_{Rd, \max}$

$$V_{RA, max} = \frac{b \cdot z \cdot 0.5 \cdot f_{cd} \cdot \frac{\cot \theta}{1 + \cot^2 \theta}}{\times 10^{-1}} = 352.0 \text{ kN}$$

$\begin{matrix} 30 & | & 14.12 & \underbrace{} \\ 0.9 \times 46 & & & 0.4 \end{matrix}$

$$A_{st} = \frac{V_{Ed} \cdot 5}{z \cdot f_{yd} \cdot \cot \theta} \times 10 = 4.57 \text{ cm}^2/\text{m}$$

$\begin{matrix} 148 & 100 \text{ cm} \\ 2 & f_{yd} & \cot \theta \\ | & | & | \\ 0.9 \times 46 & | & 2 \\ 391.3 & & \end{matrix}$

da dividere per n bracci

quindi $\phi 8/20$

$$1 \phi 8 \rightarrow A_s = 0.5 \text{ cm}^2$$

$$2 \text{ bracci} \rightarrow A_s = 0.5 \times 2 = 1 \text{ cm}^2 \rightarrow \text{occorrono } 4,57 (\text{ovvero } 5) \phi 8 / \text{metr.}$$

Dati sezione e τ_{eff} CALCOLARE V_{KA}

sezione 30×50 ha calcolato che $V_{Rd,max} = 352.0 \text{ KN}$
per $\cot \theta = 2$

ma $\cot \theta = 2$, controllando di non superare 352.0 KN

$$V_{Rd,s} = \frac{A_{st}}{s} \cdot z \cdot f_{yd} \cdot \cot \theta \times 10^{-1} = 162.0 \text{ KN} < 352.0 \quad \text{OK}$$

per $\phi 8/20$

$\frac{A_{st}}{s}$	z	f_{yd}	$\cot \theta$
20	41.4	391.3	2

2×0.5

OK
 $\cot \theta = 2$

Ricordare che la sezione porta, al massimo, $V_{Rd,max}(\cot \theta = 1) = 440 \text{ KN}$

There a tension 80×28

$$d = 24 \text{ cm} \quad z = 21.6 \text{ cm}$$

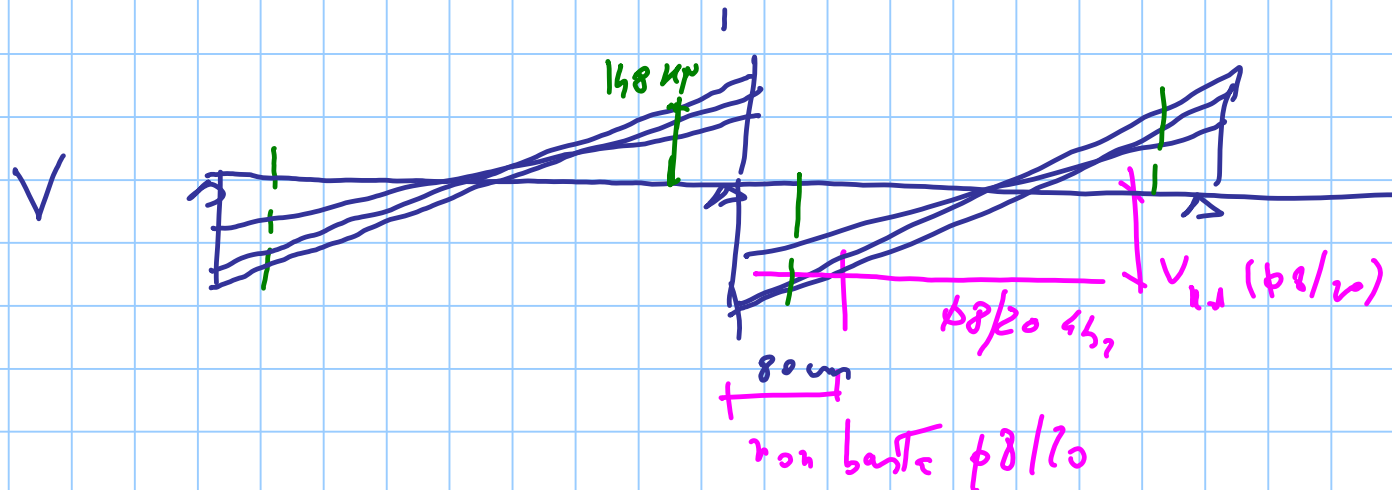
$$V_{Rd, max} = b z 0.5 f_{cd} \frac{\cot \theta}{1 + \cot^2 \theta} = 489.7 \text{ kN} \quad \cot \theta = 2$$

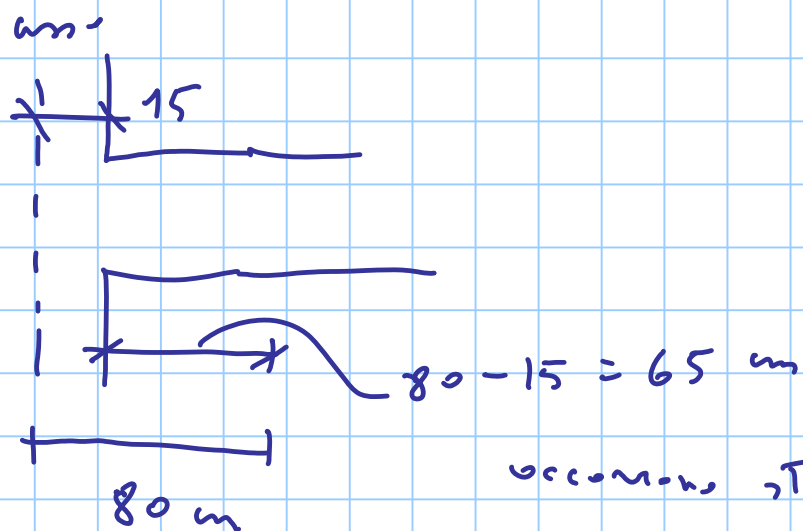
$$612.1 \text{ kN} \quad \cot \theta = 1$$

$$V_{Rd, s} = \frac{A_{st}}{s} z f_{yd} \cot \theta = 225.4 \text{ kN} < 489.7 \text{ kN} \quad \text{OK} \quad \cot \theta = 2$$

$\phi 8/15$

4 bracci

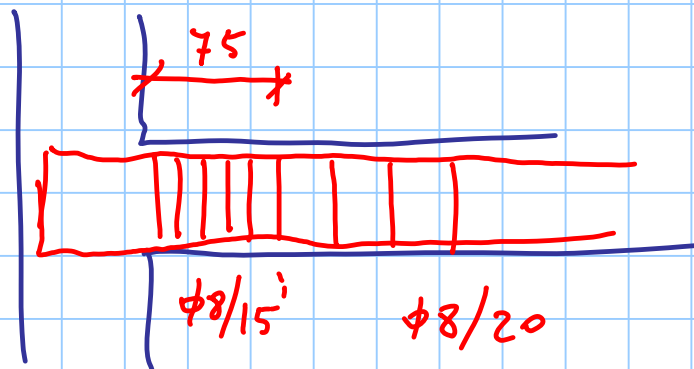




occorrono 7 barre $\phi 8/15$ per 80 cm dall'asse

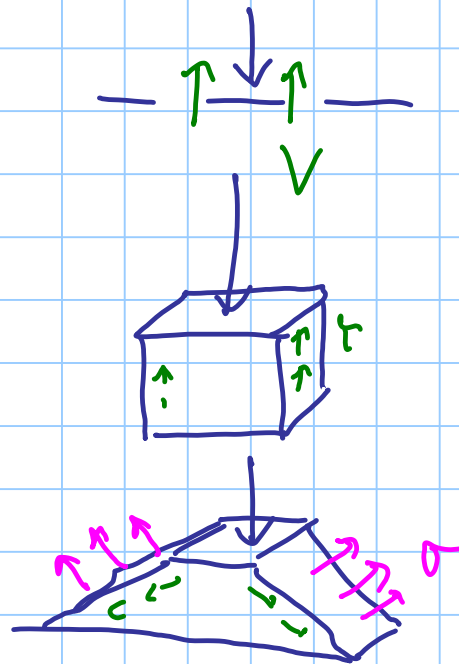
moltiplo di 15 maggiore o uguale a 65 : 75

$\phi 8/15$ per un tratto di 75 cm



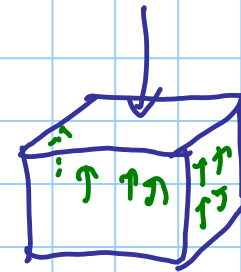
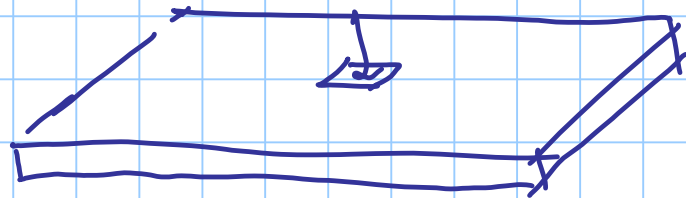
PUNZONAMENTO

elemento monodimensionale
(trave)

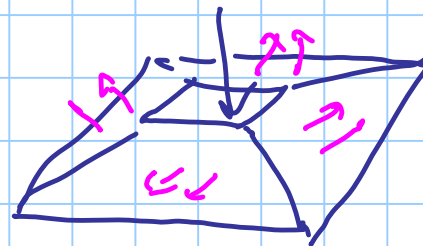


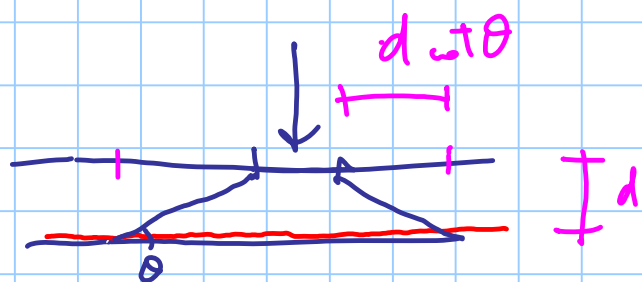
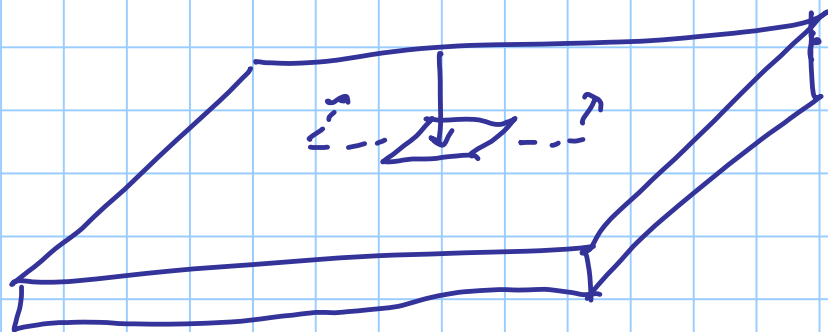
2 facce

elemento bidimensionale



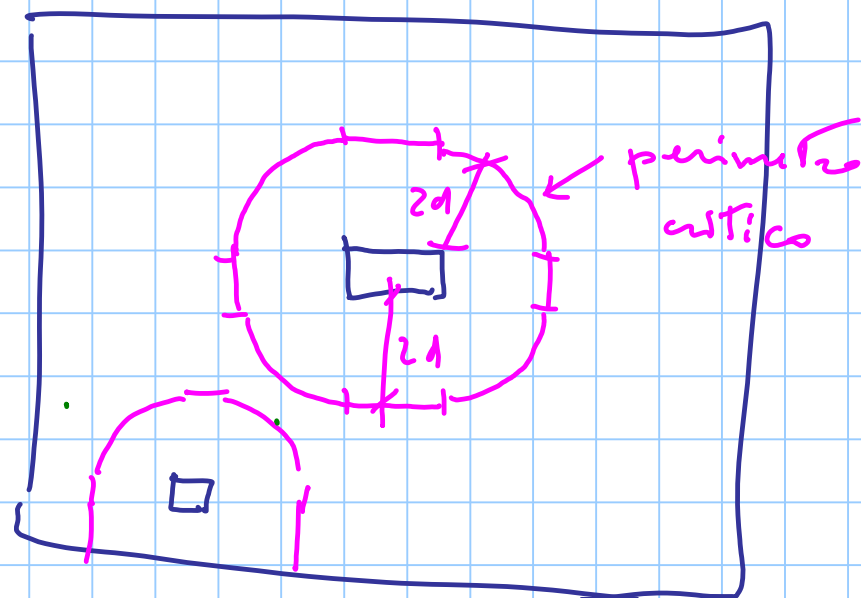
4 facce





$$\cos \theta = 2$$

SEZIONE



Pianta