

SFERA



$$\gamma_{||} = \frac{V}{a l} \quad \text{ellipticità}$$

$$\sigma_{\perp}^2 + 3(\gamma_{||}^2 + \gamma_{\perp}^2) \leq f_{wd}^2$$

$$\gamma_{||} \leq \frac{f_{wd}}{\sqrt{3}} = f_{v,wd}$$

$$a = 8 \text{ mm}$$

$$l = 200 \text{ mm}$$

$$S \ 275$$

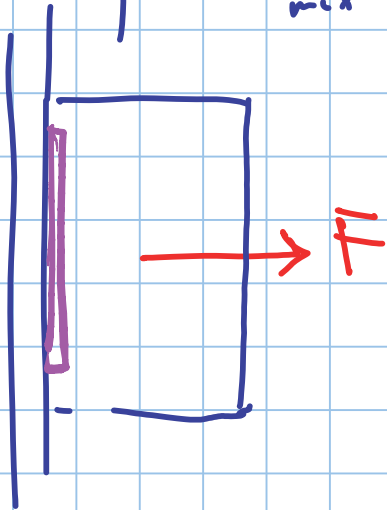
$$\frac{V}{a l} \leq f_{v,wd}$$

$$\begin{aligned} V_{res} &= a l f_{v,wd} = \\ &= 8 \times 200 \times 280.6 \times 10^{-3} = \\ &= 449.0 \text{ kN} \end{aligned}$$

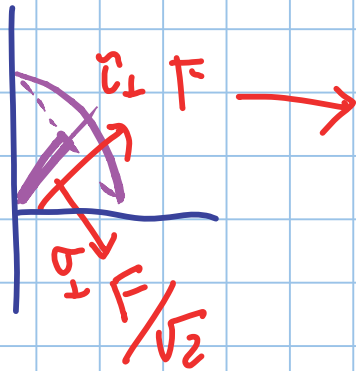
$$f_{wd} = \frac{f_u}{\beta_w \gamma_{M2}} = \frac{430}{0.85 \times 1.25} = 404.7 \text{ MPa}$$

$$f_{v,wd} = \frac{f_{wd}}{\sqrt{3}} = 280.6 \text{ MPa}$$

so for $F_{max} = 404.7 \text{ kN}$



$a \quad l$



$$\sigma_{\perp} = \frac{F}{\sqrt{2} a l}$$

$$c_{\perp} = "$$

$$\sigma_{\perp}^2 + 3(c_{\perp}^2 + c_{\perp}^2) \leq f_{wd}^2$$

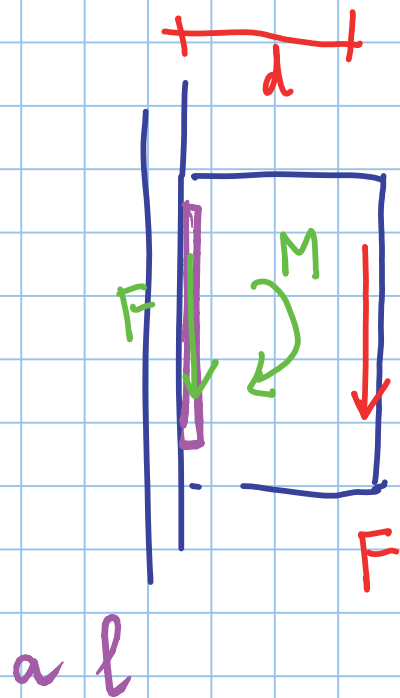
$$\frac{F^2}{2 a^2 l^2} + 3 \frac{F^2}{2 a^2 l^2} \leq f_{wd}^2$$

$$\frac{2 F^2}{a^2 l^2} \leq f_{wd}^2$$

$$F \leq \frac{a l f_{wd}}{\sqrt{2}} =$$

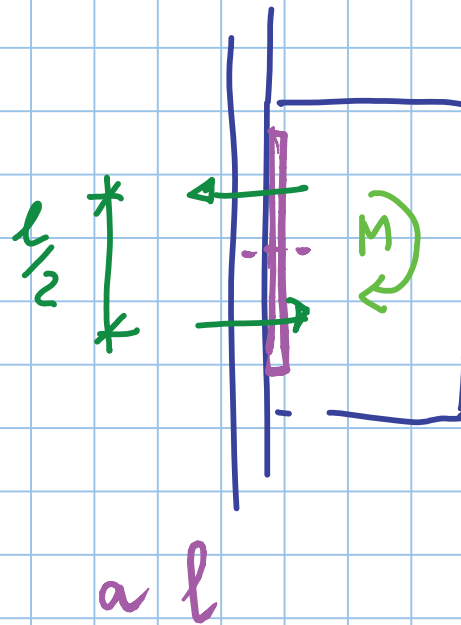
$$= 8 \times 200 \times \frac{404.7}{\sqrt{2}} =$$

$$= 457.9 \text{ kN}$$



$$V = F$$

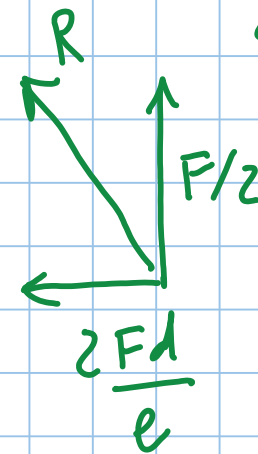
$$M = Fd$$



SFERA

$$\frac{M}{l/2} = \frac{2Fd}{l}$$

$F/2$



$$R = \sqrt{\left(\frac{F}{2}\right)^2 + \left(\frac{2Fd}{l}\right)^2}$$

$$\leq \frac{al}{2} f_{v,wd}$$

ellissoide

$$\frac{F}{2} \Rightarrow \tau_{//} = \frac{F/2}{a l/2} = \frac{F}{a l}$$

$$2 \frac{F d}{l} \Rightarrow \sigma_{\perp} = \frac{2 \frac{F d}{l} \frac{1}{\sqrt{2}}}{a l/2} = \frac{4}{\sqrt{2}} \frac{F d}{a l^2}$$

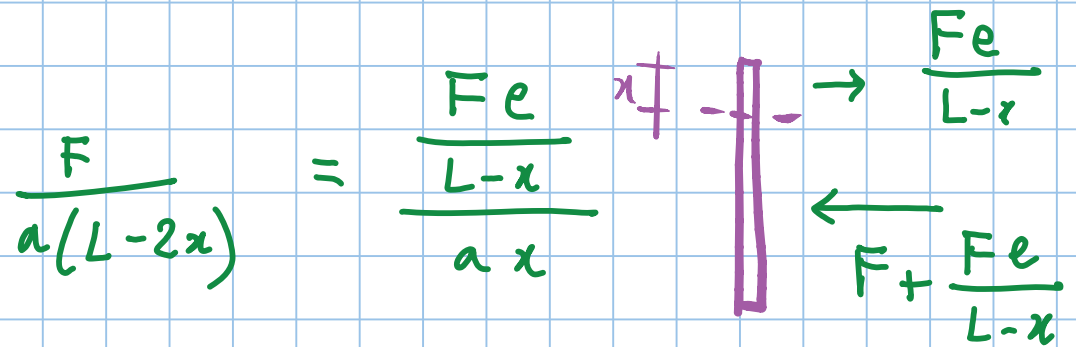
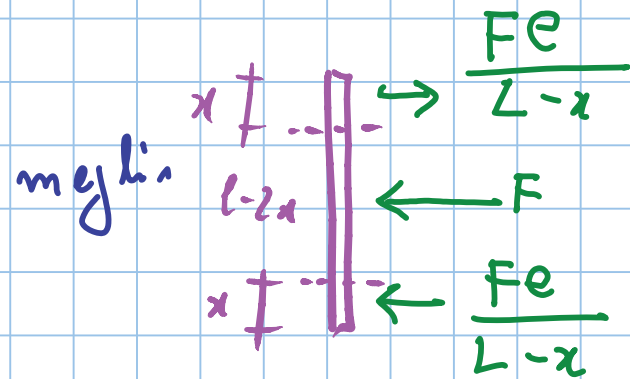
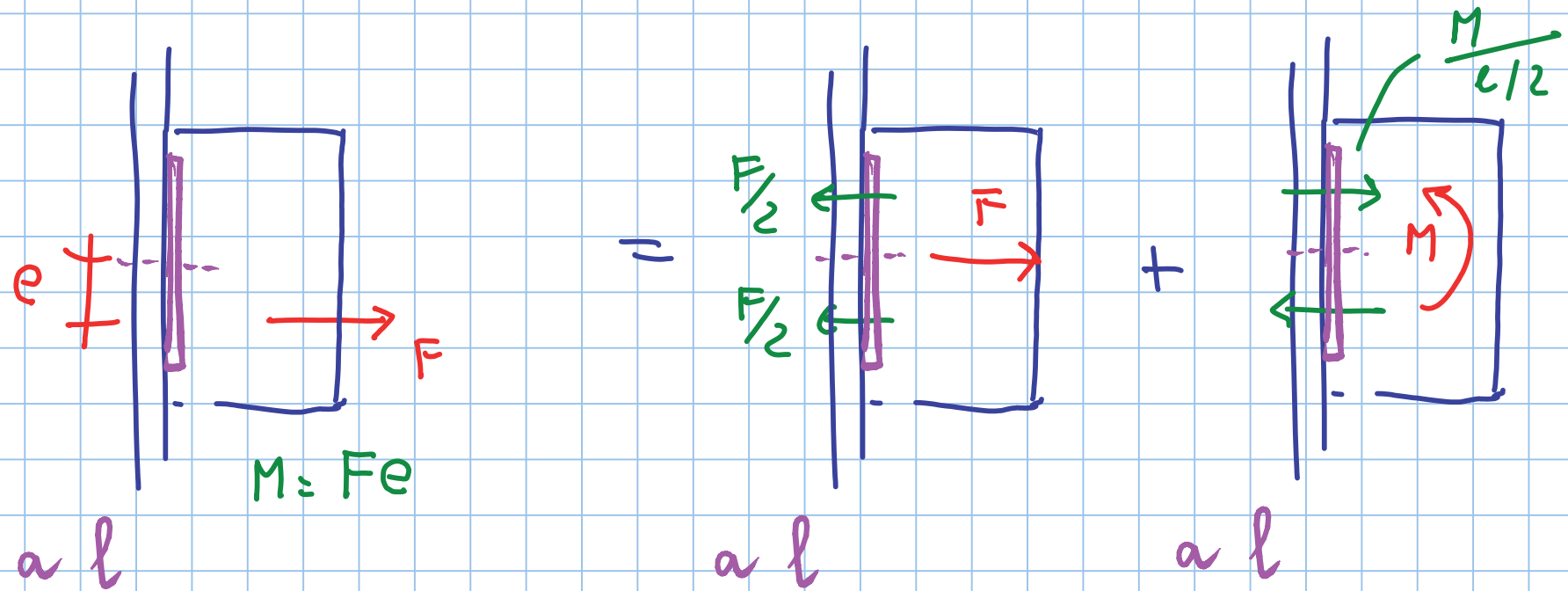
$$\tau_{\perp} = \sigma_{\perp}$$

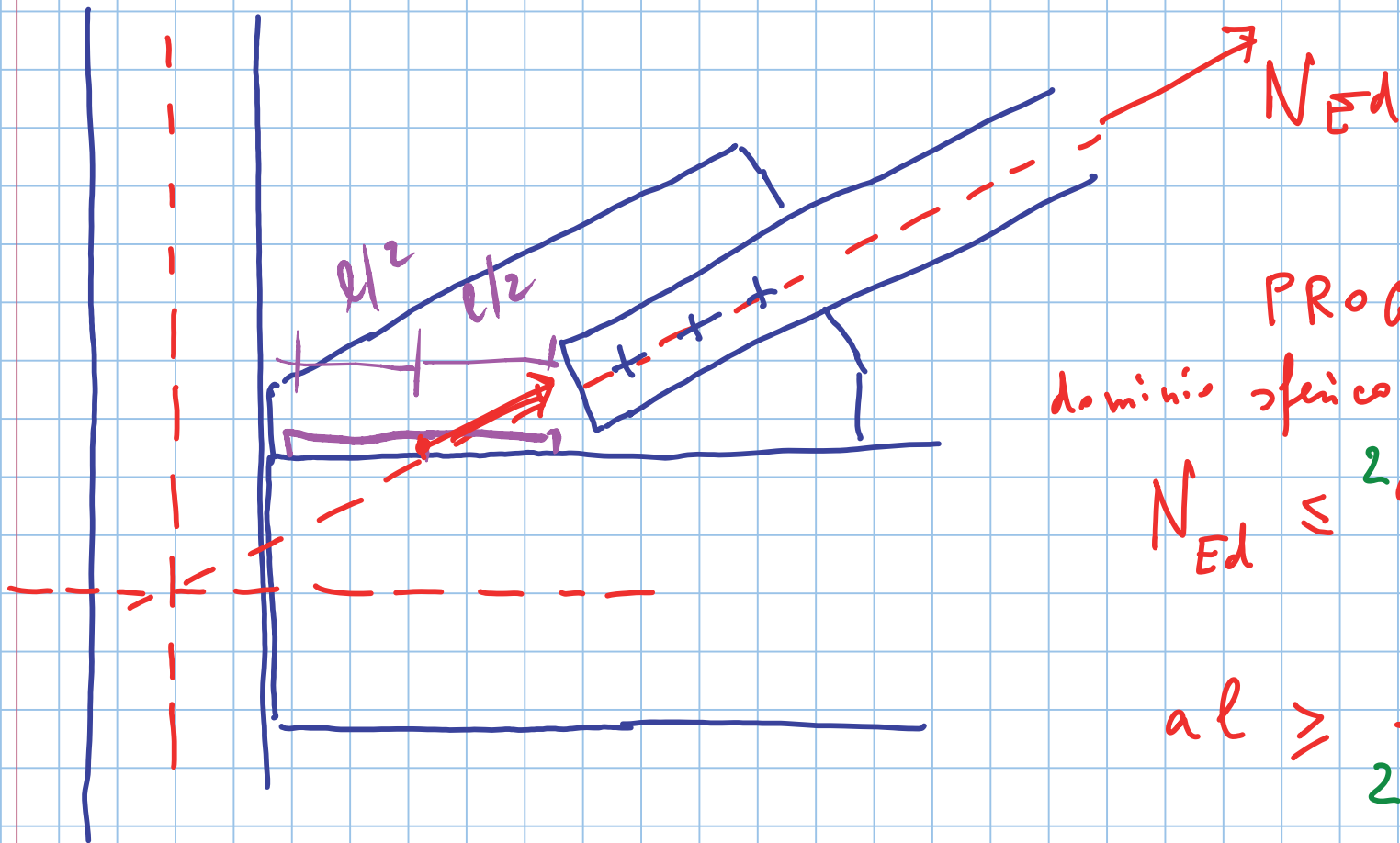
$$\left(\frac{4}{\sqrt{2}} \frac{F d}{a l^2} \right)^2 + 3 \left[\left(\frac{F}{a l} \right)^2 + \left(\frac{4}{\sqrt{2}} \frac{F d}{a l^2} \right)^2 \right] \leq f_{\text{val}}^2$$

$$4 \left(\frac{1}{\sqrt{2}} \frac{F d}{a l^2} \right)^2 + 3 \left(\frac{F}{a l} \right)^2 \leq f_{\text{wd}}^2$$

$$F^2 \left[32 \frac{d^2}{a^2 l^4} + \frac{3}{a^2 l^2} \right] \leq f_{\text{wd}}^2$$

$$F \leq \frac{1}{\sqrt{32 \frac{d^2}{l^2} + 3}} f_{\text{wd}} \cdot a l$$





PROGETTO
dominio specifico

$$N_{Ed} \leq 2 a l f_{v,red}$$

$$a l \geq \frac{N_{Ed}}{2 f_{v,red}}$$

perché in genere i carboni
sono 2 (da due lati)

