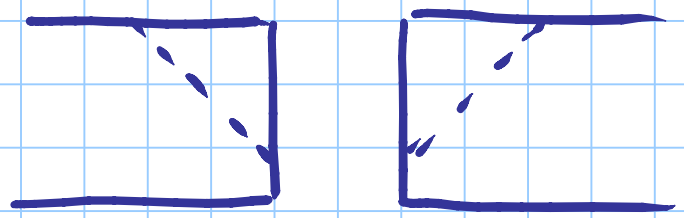
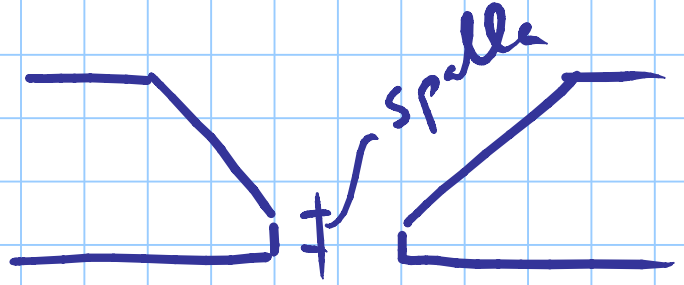
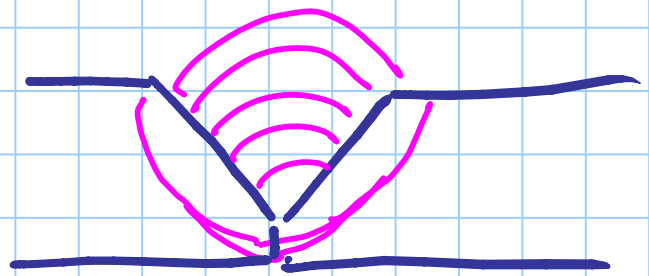
Titolo nota 15/01/2014





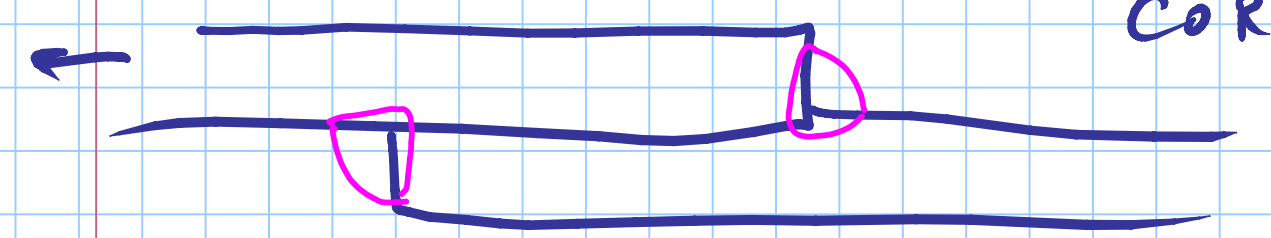


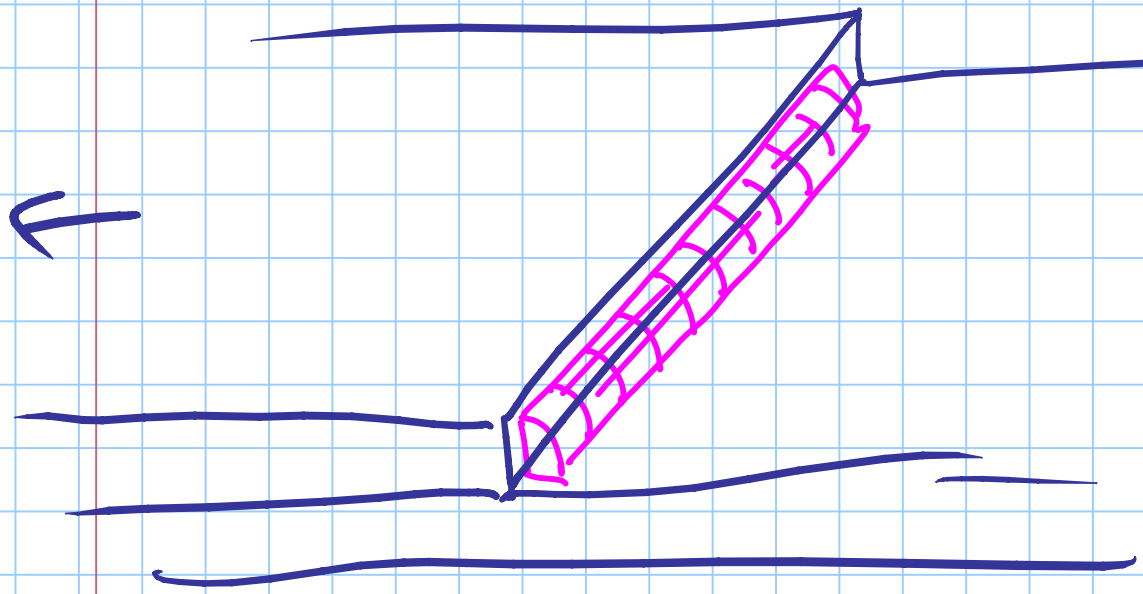
CIANFRINA

SALDATURA A

COMPLETA PENETRAZIONE

SALDATURA A CORD.NE D'ANGOLO





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

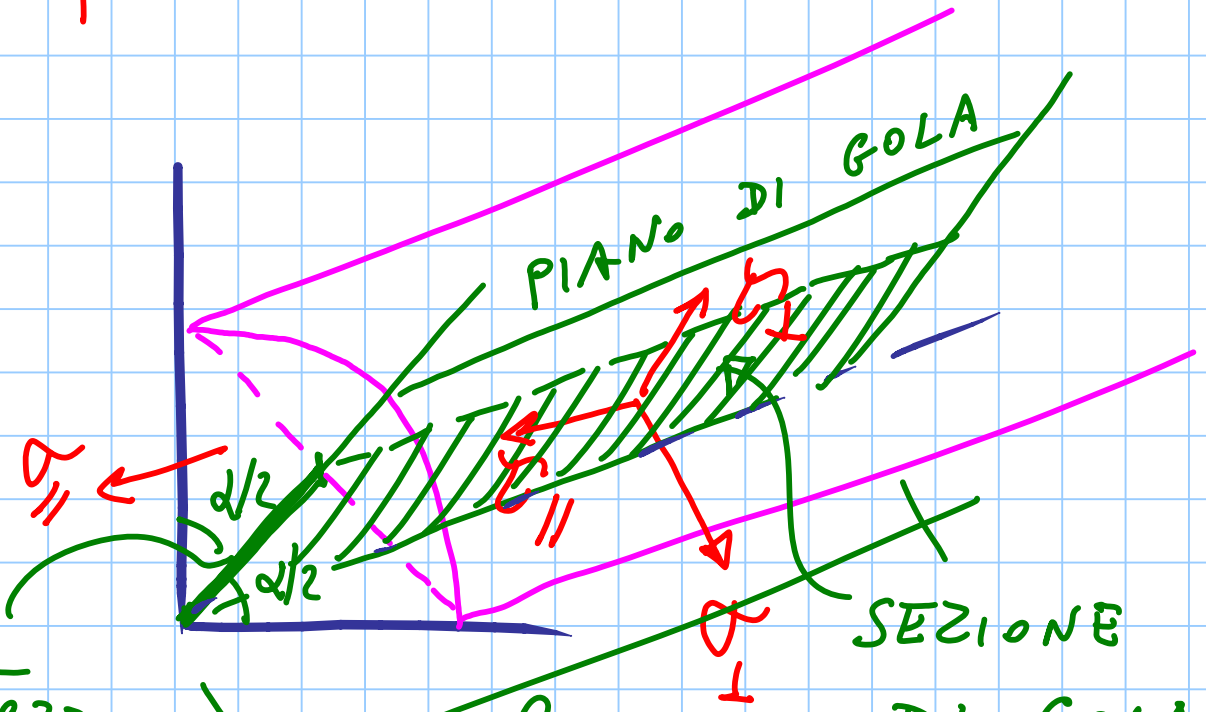
$$\tau_{\perp} = \frac{F}{a\,l\,\sqrt{2}}$$

$$\tau_{\parallel} = 0$$

$\tau_{\parallel}$ tau parallela

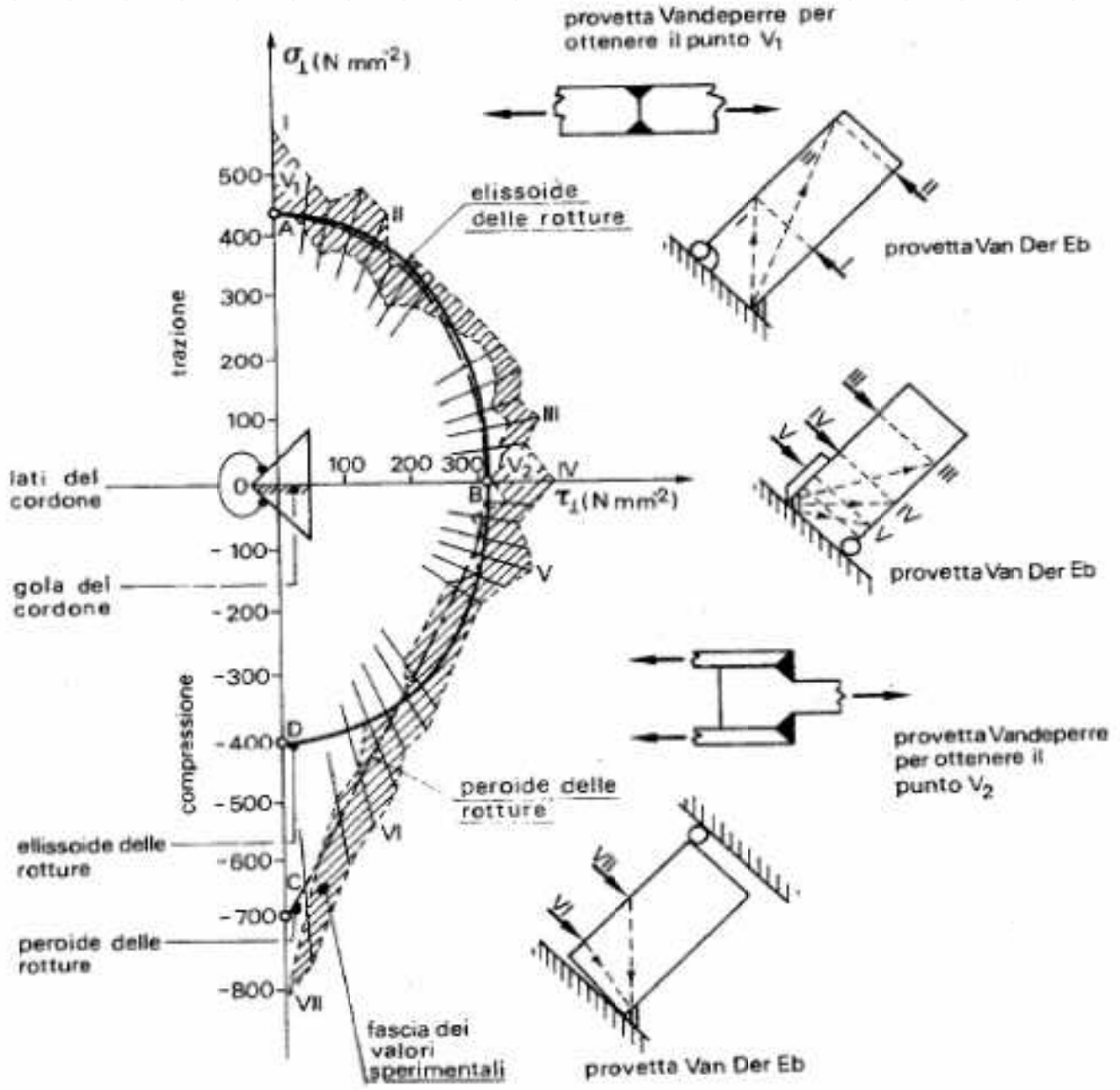
$\tau_{\perp}$

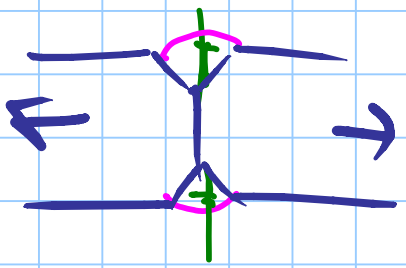
$\sigma_{\perp}$

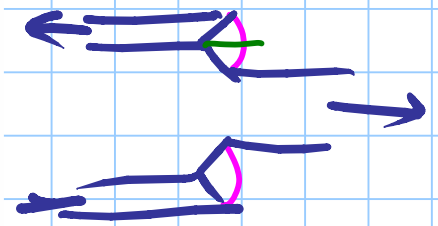


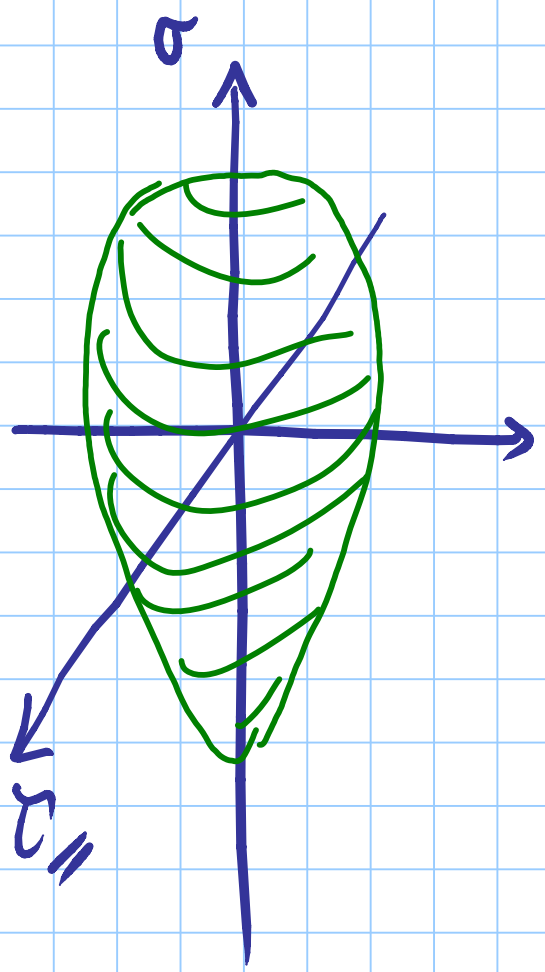
a = altezza di gola

l lunghezza della saldatura


provetta Vandeperre per ottenere il punto V_1
$\sigma_\perp$ (N mm^{-2})
elissoide delle rotture
provetta Van Der Eb
trazione
lati del cordone
gola del cordone
$\tau_\perp$ (N mm^{-2})
provetta Van Der Eb
provetta Vandeperre per ottenere il punto V_2
compressione
peroide delle rotture
ellissoide delle rotture
peroide delle rotture
fascia dei valori sperimentali
provetta Van Der Eb







PEROIDE

⇓

ELLISSOIDE

$$\left(\frac{\sigma_\perp}{\sigma_\perp^{max}}\right)^2 + \left(\frac{\tau_\perp}{\tau_\perp^{max}}\right)^2 + \left(\frac{\tau_{//}}{\tau_{//}^{max}}\right)^2 = 1$$

$\sigma_\perp^{max} \approx f_{wd}$ = resistenza (a trazione) della saldatura

$\tau_\perp^{max} < f_{wd}$ $\quad$ $\tau_{//}^{max} < f_{wd}$ $\quad$ w → welding (saldatura)

$\searrow \frac{f_{wd}}{\sqrt{3}}$ $\quad$ $\searrow \frac{f_{wd}}{\sqrt{2}}$

$$\sigma_\perp^2 + 3\tau_\perp^2 + 2\tau_{//}^2 = f_{wd}^2$$

$\Downarrow$

ellissoide di rotazione

$$\sigma_\perp^2 + 3\tau_\perp^2 + 3\tau_{//}^2 = f_{wd}^2$$

$$\sqrt{\sigma_L^2 + 3(\tau_L^2 + \tau_{//}^2)} \leq f_{wd}$$ verifica di resistenza

sforzo di varie segni (Compressione, Trazione)

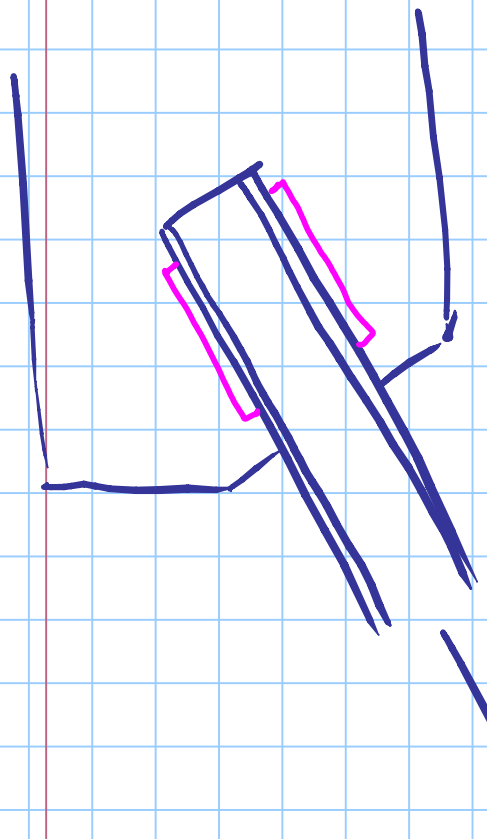
sforzo normale (Taglio)

$$\Downarrow$$

sforzo di segni $\frac{f_{wd}}{\sqrt{3}}$ $\Rightarrow$ $\sqrt{\sigma_L^2 + \tau_L^2 + \tau_{//}^2} \leq \frac{f_{wd}}{\sqrt{3}}$

$$f_{w1} = \frac{f_u}{\beta_w \gamma_{M2}} \qquad f_{vwd} \geq \frac{f_{w1}}{\sqrt{3}} = \frac{f_u}{\beta_w \sqrt{3} \gamma_{M2}}$$

$\beta_w =$		$1/\beta_w =$	
	0.80	1.25	S235
	0.85	1.176	S275
	0.90	1.111	S355



2 UPN 100
S275

$F_d = 300$ kN

4 cordoni

UPN $A = 13.50 \times 10^2$ mm²

2 UPN $N_{Rd} = 707$ kN

$f_{ud} = 404.7$ MPa

$$f_{vwd} = \frac{430}{0.85 \times \sqrt{3} \times 1.25} =$$

$= 233.7$ MPa

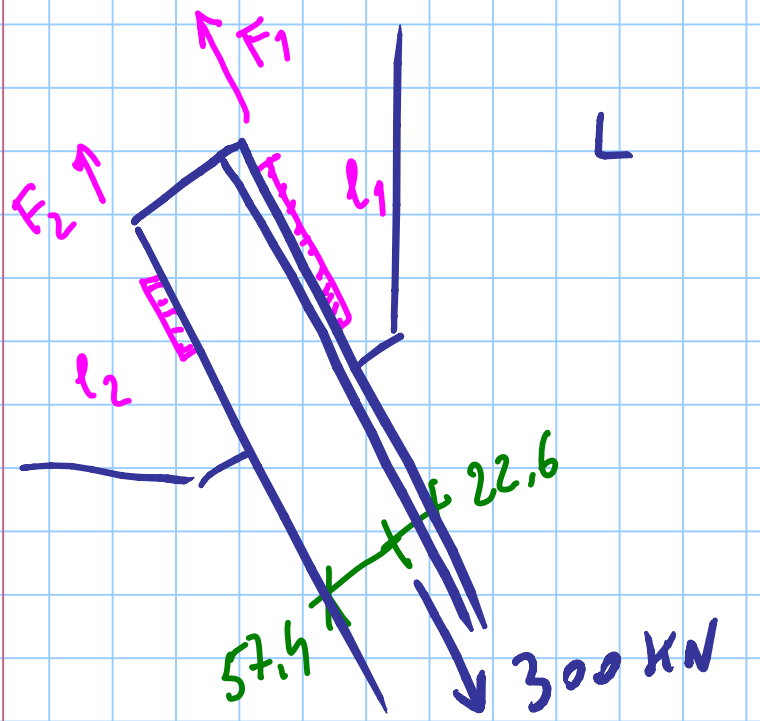
$$\frac{F_d}{4\,a\,l} \leq f_{vwd}$$

$$a\,l \geq \frac{F_d}{4\,f_{vwd}} =$$

$$= \frac{300 \times 10^3}{4 \times 233{,}7} = 321\ mm^2$$

$a = 6\ mm$

$$l \geq \frac{321}{6} = 54\ mm$$



L

$A = 12.3 \times 10^2 \text{ mm}^2$

2 L 80×80×8

S 275

$$2\,a\,(l_1 + l_2)\,f_{vwd} \geq F_1$$

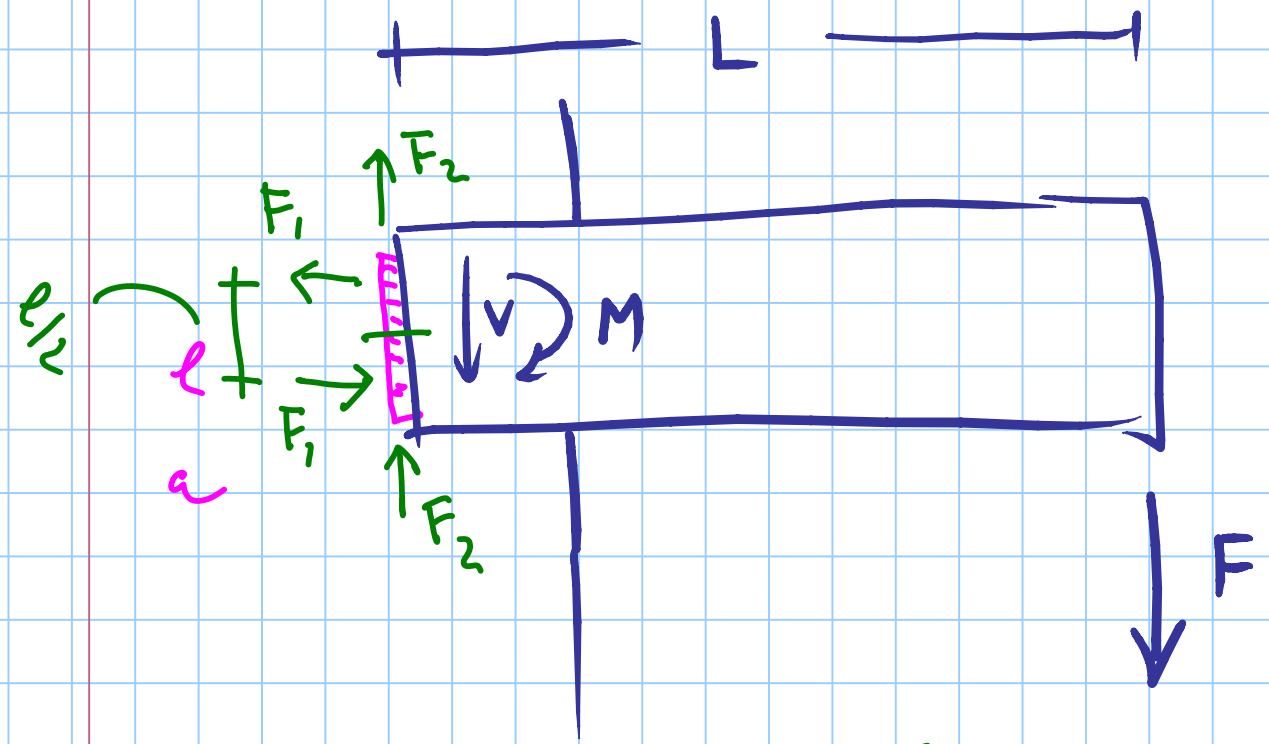
$$\frac{F_1}{57.4} = \frac{F_2}{22.6}$$

$$F_1 = \frac{57.4}{57.4 + 22.6}\,(F_1 + F_2)$$

$$l_1 + l_2 = \frac{Fd}{2af_{vwd}} = \frac{300 \times 10^3}{2 \times 6 \times 233.7} = 107 \text{ mm}$$

$$l_1 = \frac{57.5}{80} \times 107 = 77 \text{ mm}$$

$$l_2 = 30 \text{ mm}$$

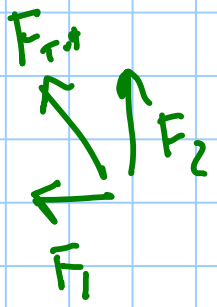


$$V = F$$

$$M = FL$$

$$F_1 = \frac{M}{l/2}$$

$$F_2 = \frac{V}{2}$$



$$F_{T.T} = \sqrt{F_1^2 + F_2^2}$$

criter. di resistenza SFERA

$$\frac{F_{Tot}}{a\ell/2} \leq f_{vwd}$$

$$\frac{\sqrt{\left(\frac{M}{\ell/2}\right)^2 + \left(\frac{V}{2}\right)^2}}{a\ell/2} \leq f_{vwd}$$

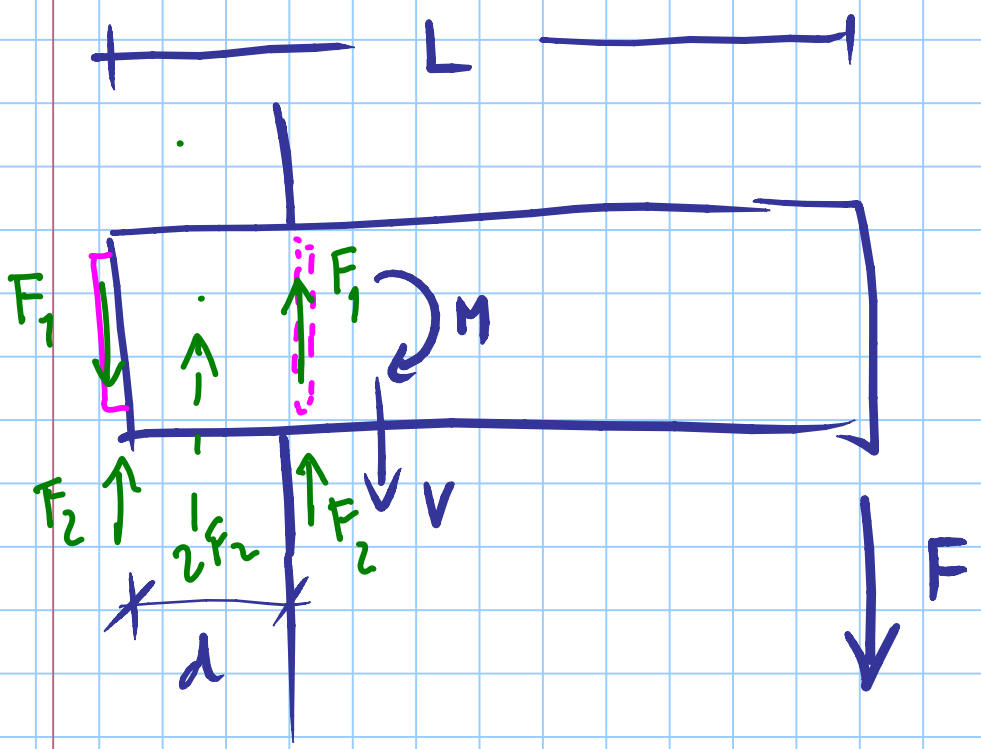
$$\left(\frac{M}{\ell/2}\right)^2 + \left(\frac{V}{2}\right)^2 \leq \left(f_{vwd}\,\frac{a\ell}{2}\right)^2$$

$$\frac{4M^2}{\ell^2} + \frac{v^2}{4} \leq f_{vwd}^2 \frac{a^2 \ell^2}{4}$$

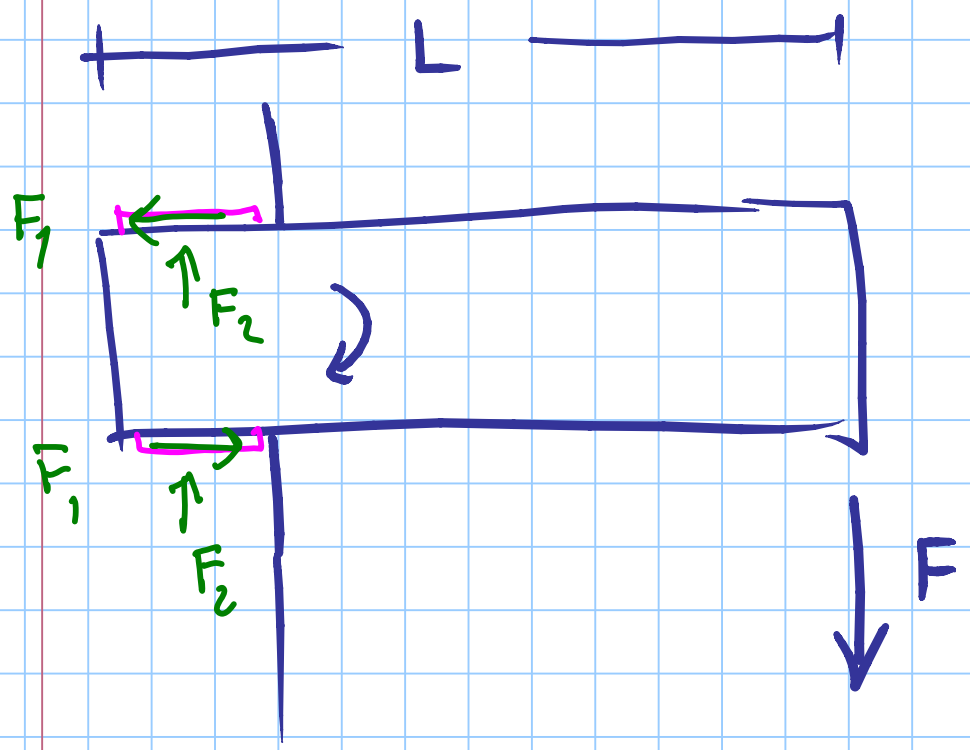
$$4M^2 + \frac{v^2}{4}\ell^2 \leq \frac{f_{vwd}^2}{4} a^2 \ell^4$$

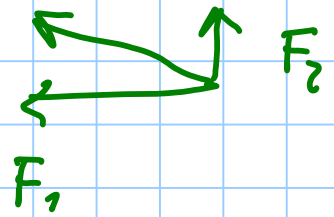
$$\frac{f_{vwd}^2}{4} a^2 \ell^4 - \frac{v^2}{4}\ell^2 - 4M^2 = 0$$

$$\ell^2 = \frac{+\frac{v^2}{4} \pm \sqrt{\left(\frac{v^2}{4}\right)^2 + 4 \cdot \left(\frac{f_{vwd}^2}{4} a^2\right) 4}}{2 \frac{f_{vwd}^2}{4} a^2}$$



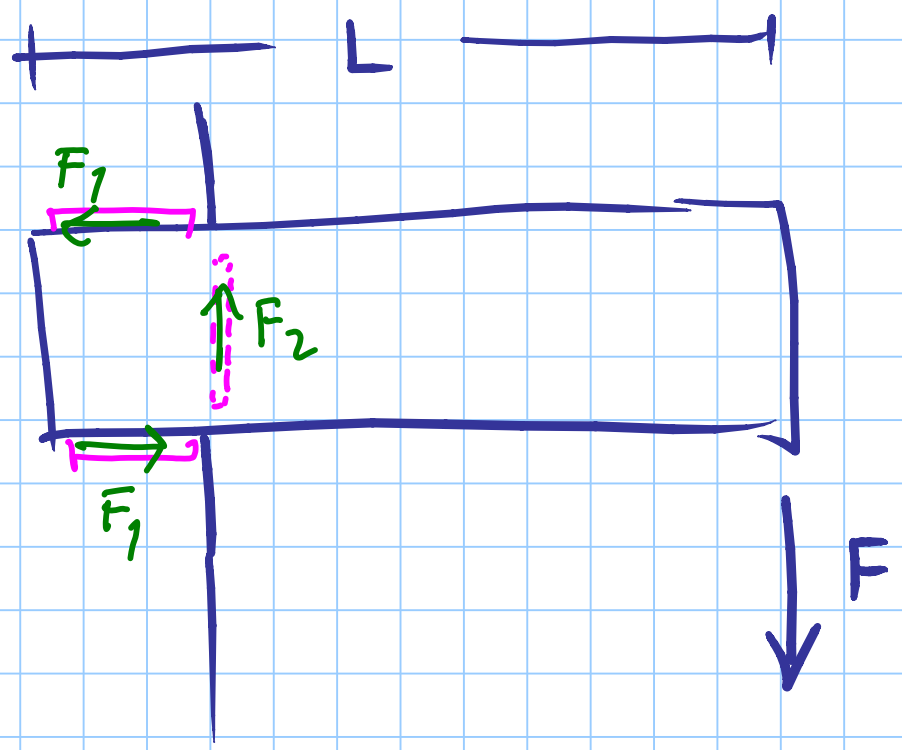
$$F_1 = \frac{F(L - d/2)}{d} \qquad F_2 = \frac{F}{2}$$





$$F_1 = \frac{M}{h}$$

$$F_2 = \frac{V}{2}$$



$$F_1 = \frac{M}{h} \qquad F_2 = V$$