Titolo nota

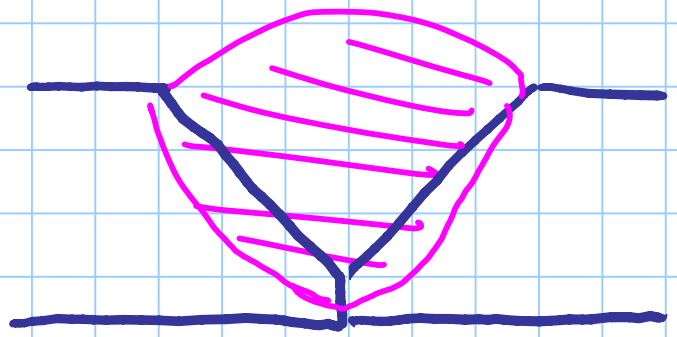
SALDATURA TESTA A TESTA

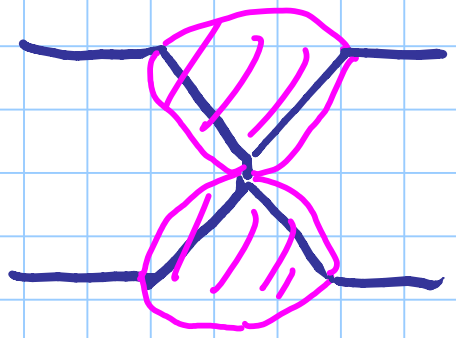
09/01/2013

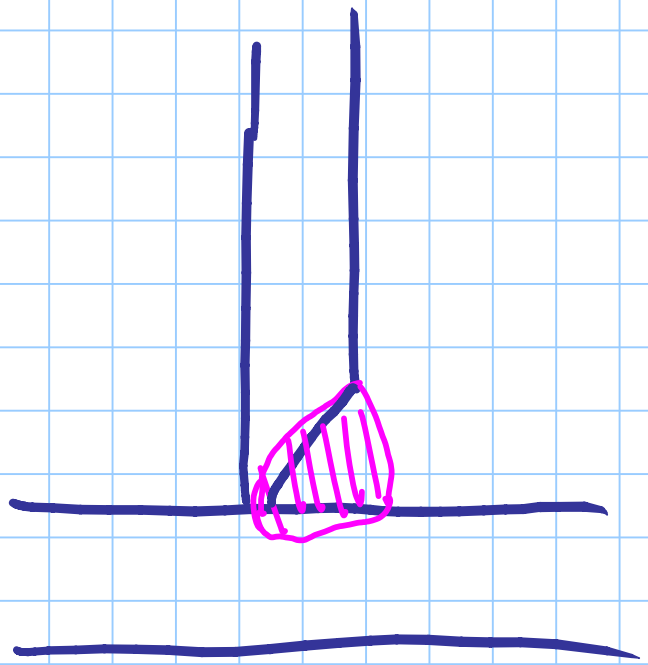
CIANFRINO

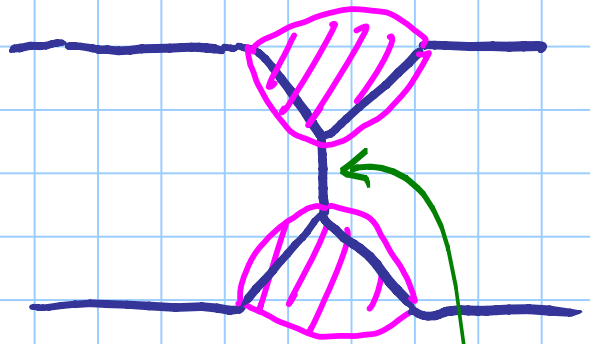
SALDATURA

A COMPLETA PENETRAZIONE









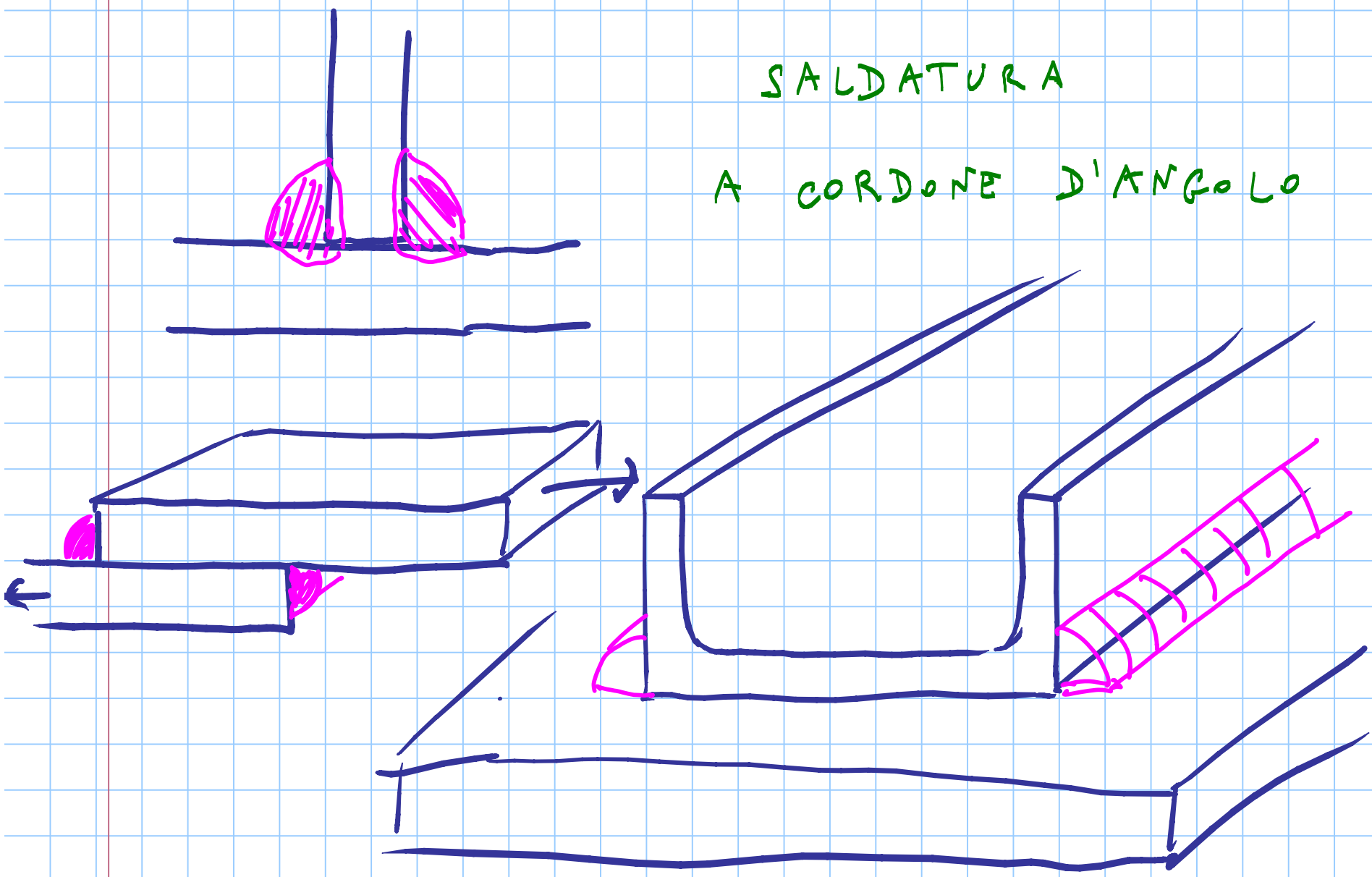
Zona non collegata

= SALDATURA A PARZIALE PENETRAZIONE

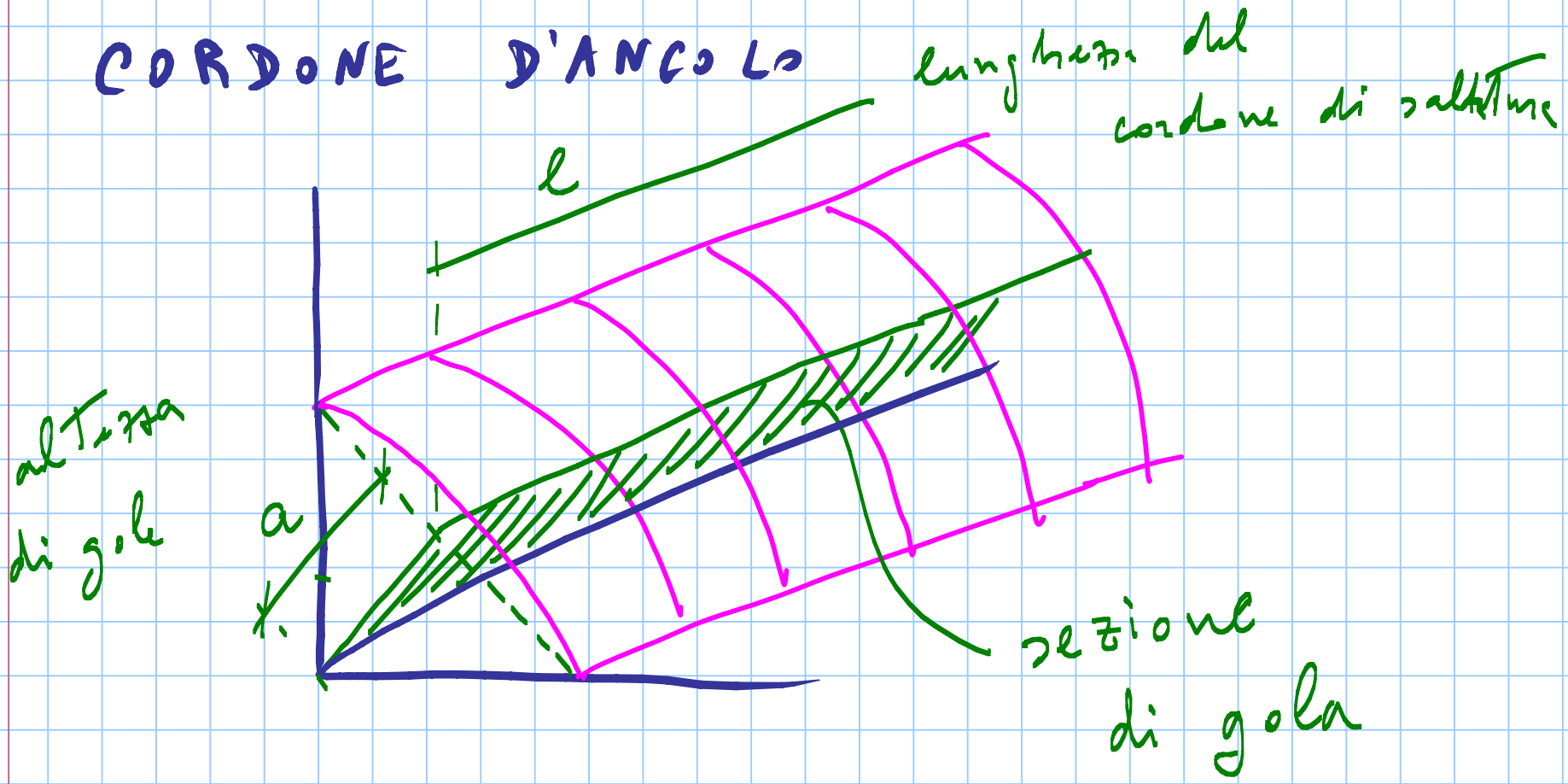
verificare come cordoni d'angolo

SALDATURA

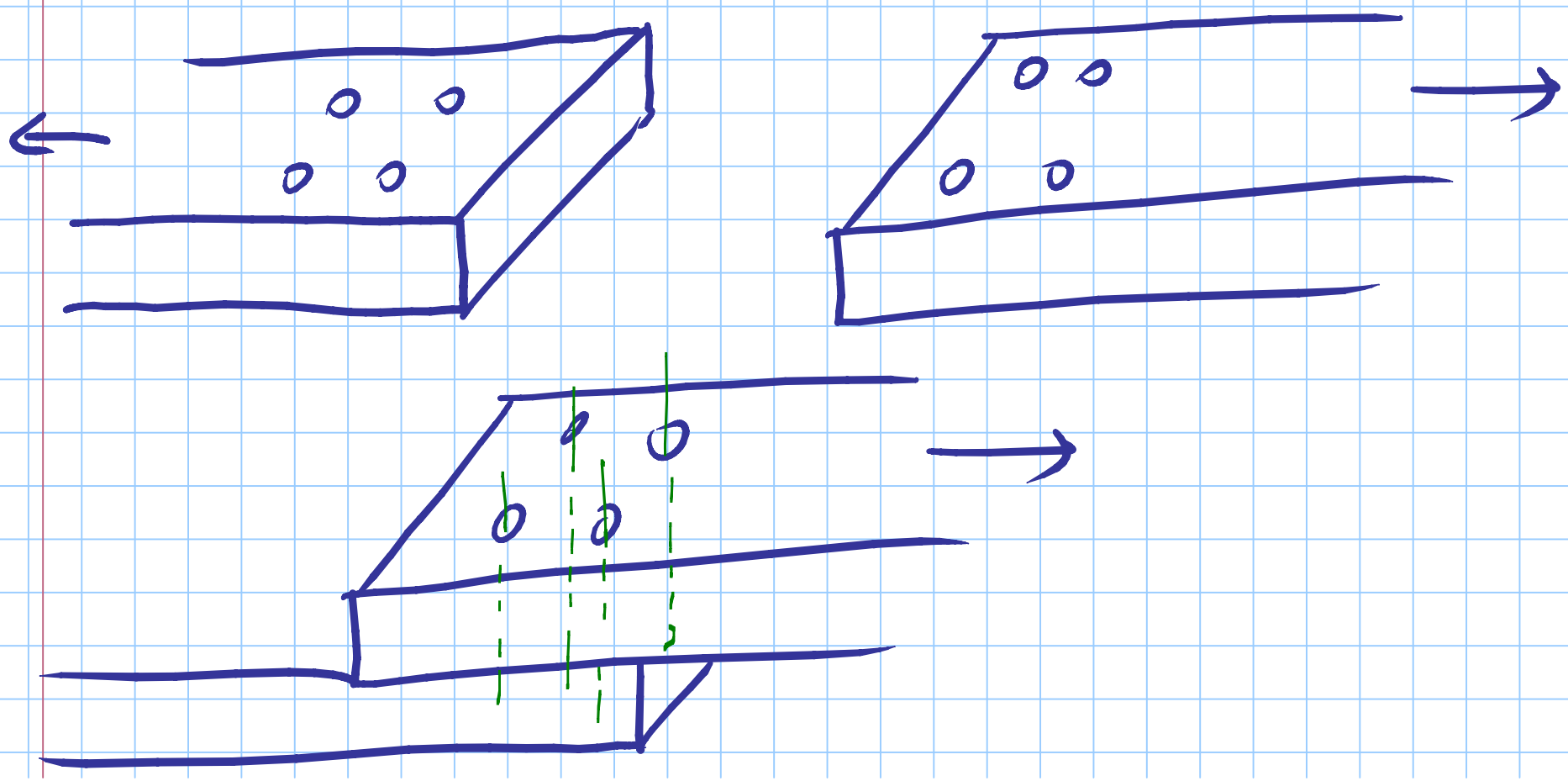
A CORDONE D'ANGOLO

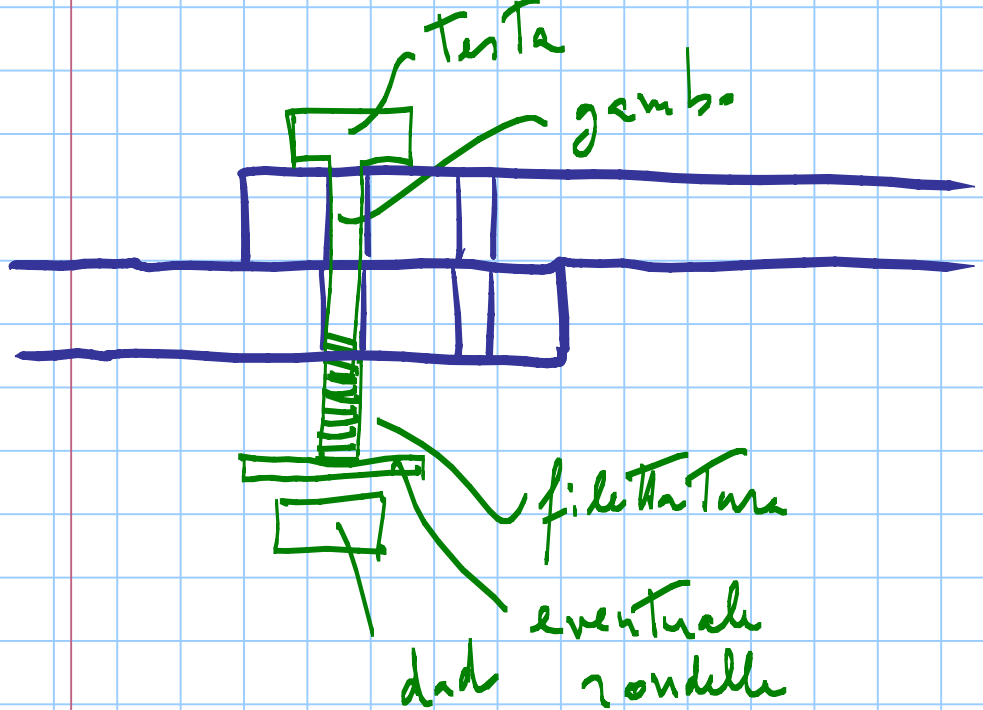


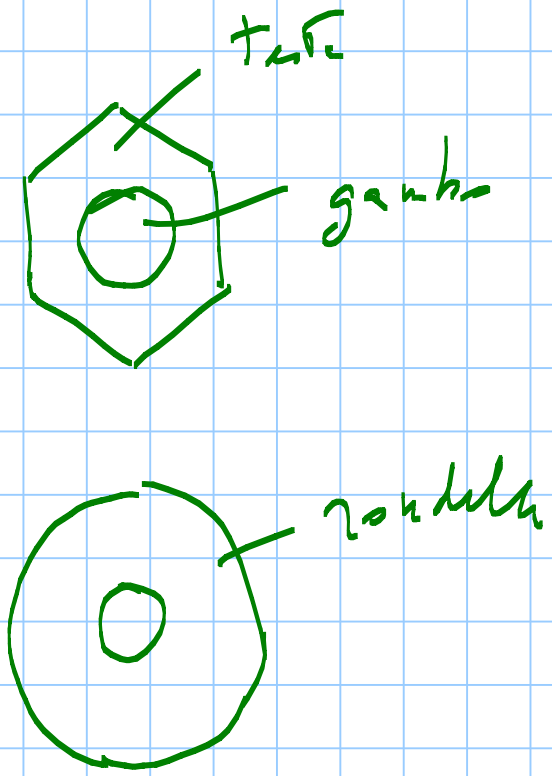
CORDONE D'ANGOLO



COLLEGAMENTI BULLONATI







diametro del gambo M16

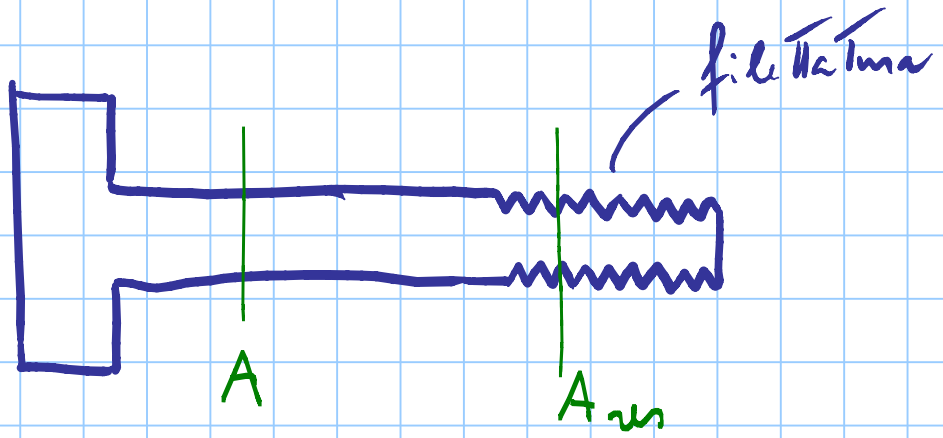
↖ diametro in mm

Tabella 3 - Passo della filettatura p (mm) e area nominale A e resistente A_{res} (mm^2)

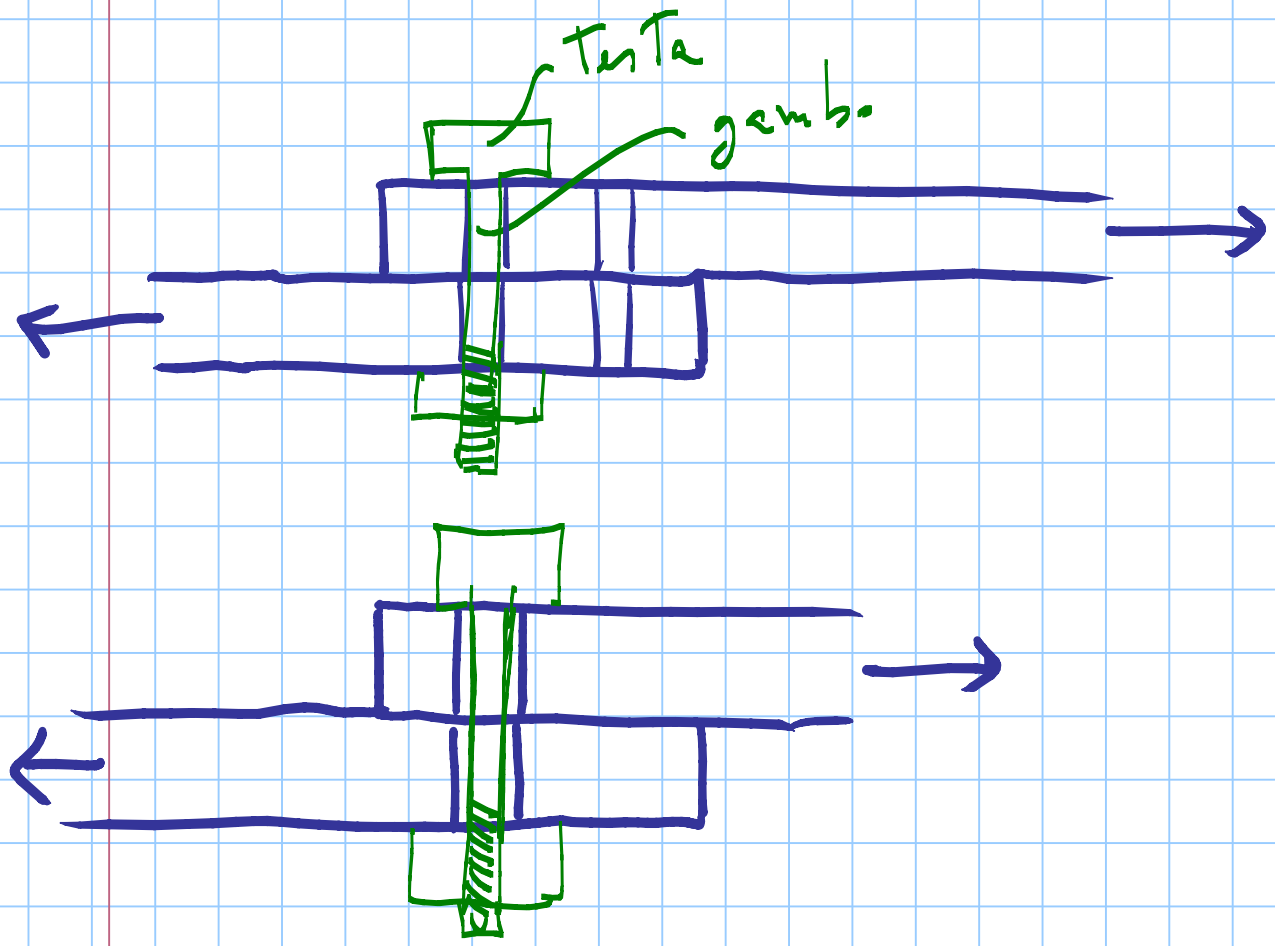
diametro d	12	14	16	18	20	22	24	27	30
passo p	1.75	2.00	2.00	2.50	2.50	2.50	3.00	3.00	3.50
A	113	154	201	254	314	380	452	573	707
A_{res}	84.3	115	157	192	245	303	353	459	581
A_{res} / A	0.75	0.75	0.78	0.75	0.78	0.80	0.78	0.80	0.82

M12 M16 M30

M16 area della sezione del gambo 201 mm^2



area resistente 157 mm^2



SERRAGGIO

- trazione nel gambo
- compressione tra i piatti

forza di serraggio:

$$F_{p,c} = 0.7 \frac{A_{res} f_{ub}}{\gamma_{M7}}$$

ma $\gamma_{M7} = 1.0$ per serraggio controllato

CLASSI DI RESISTENZA DEI BULLONI

4.6

5.6

6.8

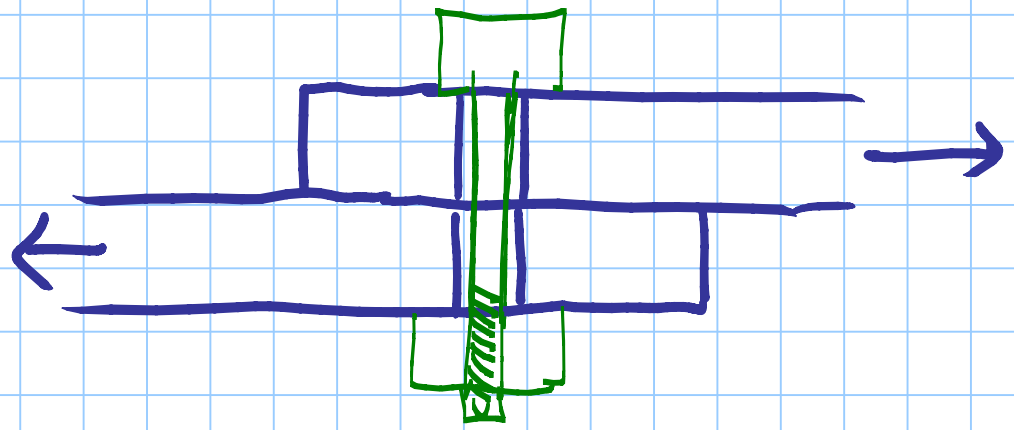
8.8

10.9

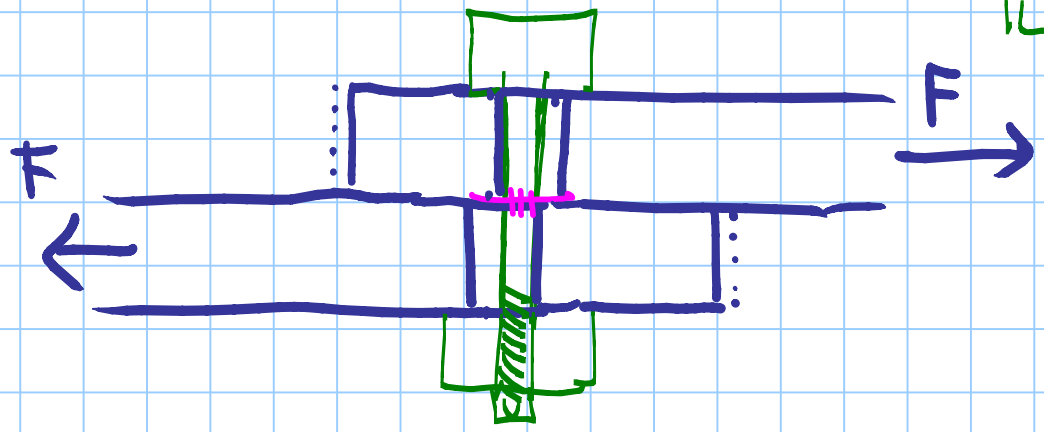
resistenza ultima (a mm. di 100) $f_{ub} = 400\ MPa$

rapporto (a mm. di $\frac{1}{10}$) $\frac{f_{yb}}{f_{ub}}$ $f_{yb} = 0.6\, f_{ub}$

bulloni ad alta resistenza



SUPERARE LA RESISTENZA AD ATTRITO



IL BULLONE LAVORA A TAGLIO

$F_{V,Ed} = F$

resistenza a Taglio

$$F_{V,Rd} = 0.6\, A\, \frac{f_{ub}}{\gamma_{M2}}$$

se la sezione di rottura è senza filettatura

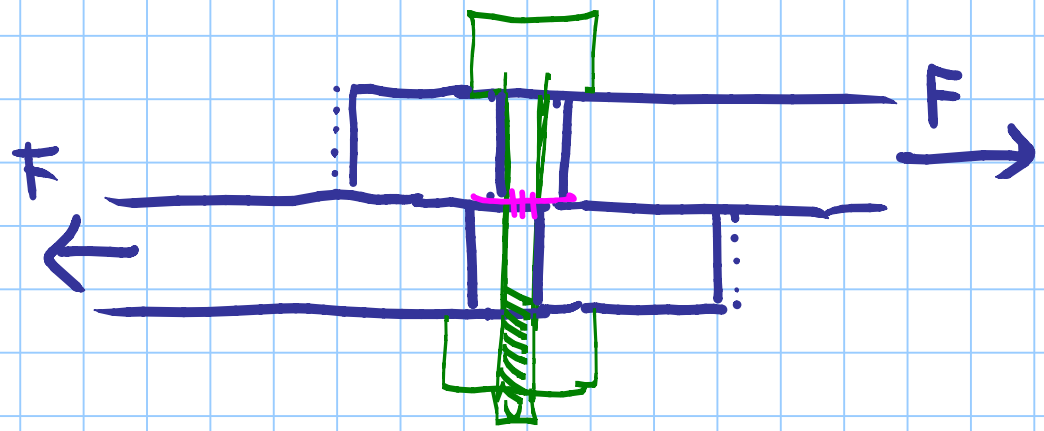
$$F_{V,Rd} = 0.6\ A\ \frac{f_{ub}}{\gamma_{M2}}$$

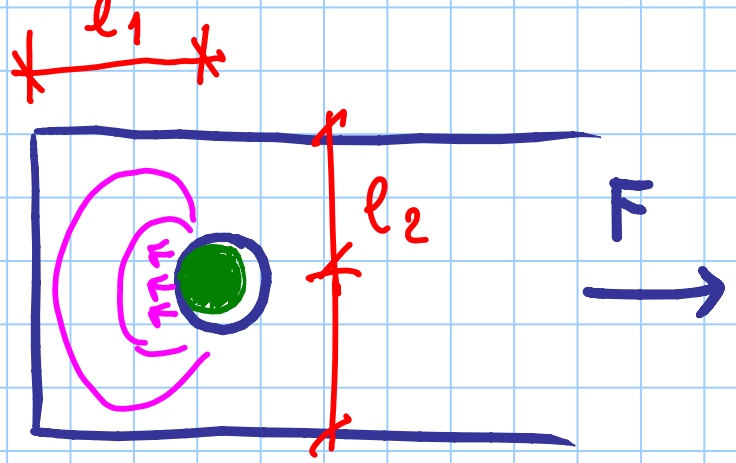
se la sezione di rottura è filettata

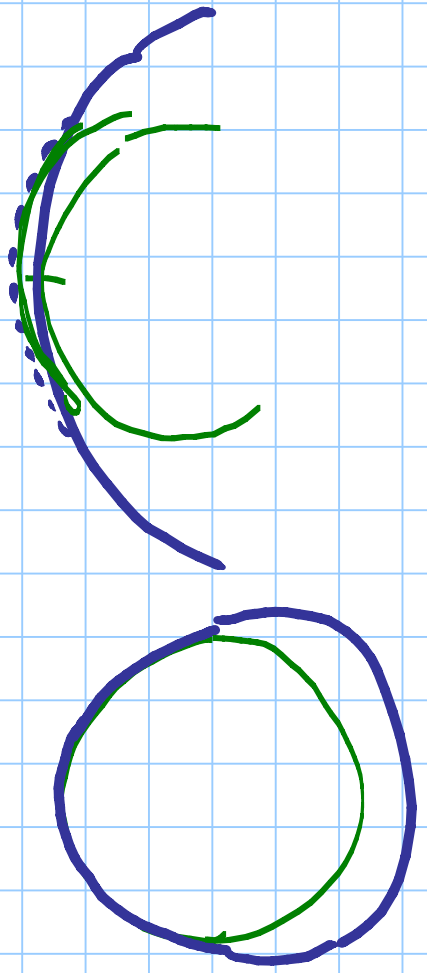
$$F_{V,Rd} = 0.6\ A_{res}\ \frac{f_{ub}}{\gamma_{M2}}$$

0.5 per classi 6.8 e 10.9

RESISTENZA A TAGLIO del bullone





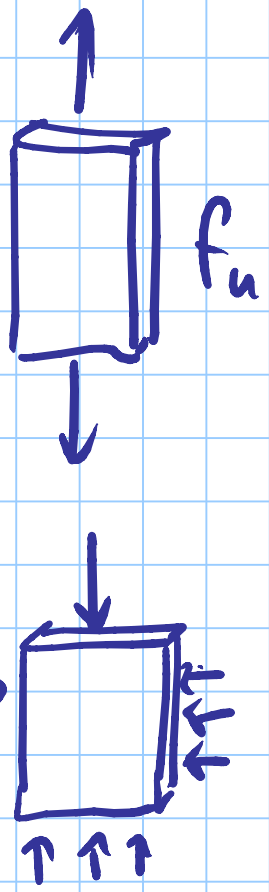


tensioni (localmente)

$$\frac{F}{d\,t}$$

d = diametro bullone

t = spessore piatto



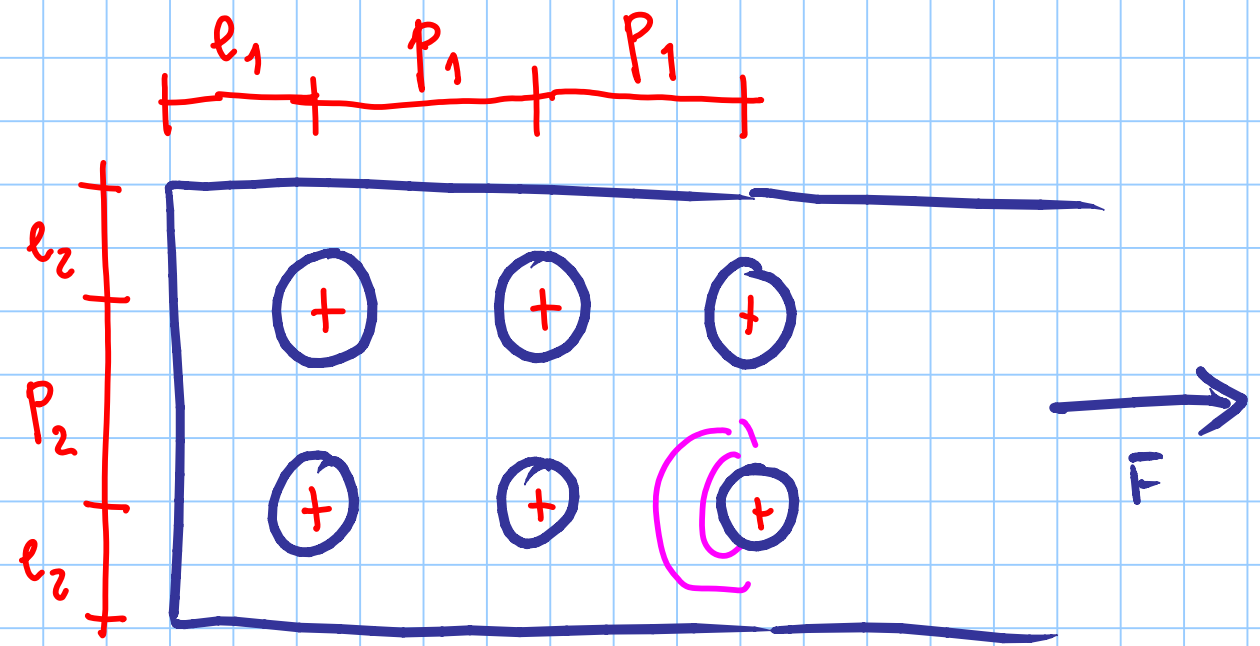
STA MEGLIO resiste a + di f_u

fino a 2.5 f_u

RESISTENZA A RIFOLLAMENTO del piatto

$$F_{b,Rd}$$

$$F_{b,R1} = \underset{\leq 1}{\alpha}\ k\ d\ t\ \underset{\leq 2.5}{f_u}\ \frac{}{\gamma_{M2}}$$



d_0 = diametro del foro

$$e_1 \; e_2 \geq 1.2 \; d_0$$

$$p_1 \geq 2.2 \; d_0$$

$$p_2 \geq 2.4 \; d_0$$

$$\alpha = \text{MIN}\left[\frac{e_1}{3 d_0} ; \frac{p_1}{3 d_0} - 0.25 ; \frac{f_{ub}}{f_u} ; 1 \right]$$

per ottenere $\alpha = 1$

$$e_1 \geq 3 d_0$$

$$p_1 \geq 3.75 d_0$$

$$f_{ub} \geq f_u$$

$$\frac{p_1}{3 d_0} - 0.25 \geq 1$$

$$p_1 \geq 3 \times (1 + 0.25) d_0$$

$$K = \text{MIN}\left[2.8 \frac{e_2}{d_0} - 1.7 ; \; 1.4 \frac{p_2}{d_0} - 1.7 ; \; 2.5 \right]$$

$K = 2.5$ $\qquad e_2 \geq 1.5\, d_0$ $\qquad 2.8 \frac{e_2}{d_0} - 1.7 \geq 2.5$

$$2.8 \frac{e_2}{d_0} \geq 4.2$$

$$p_2 \geq 3\, d_0$$