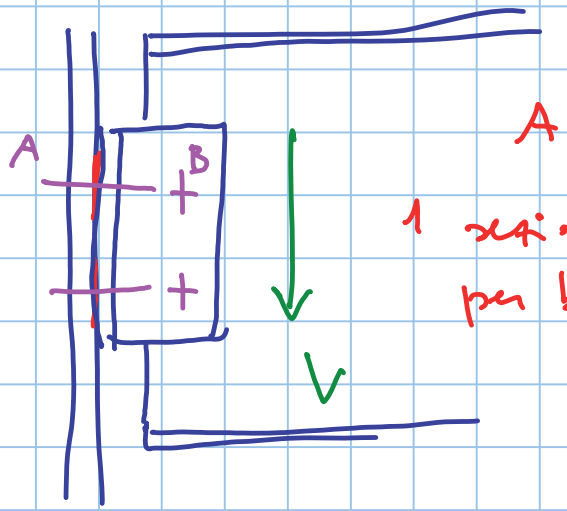
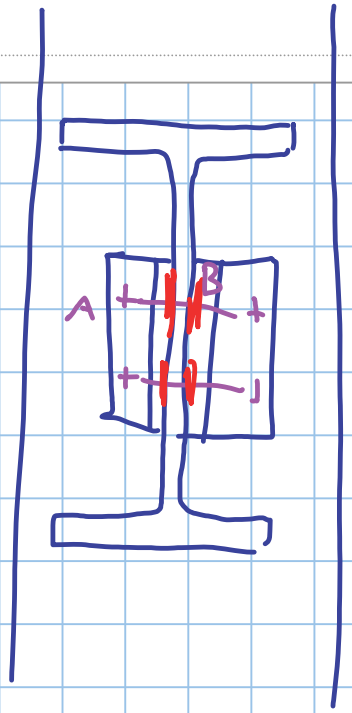
Titolo nota 19/12/2018



A

1 sezione per bullone



B

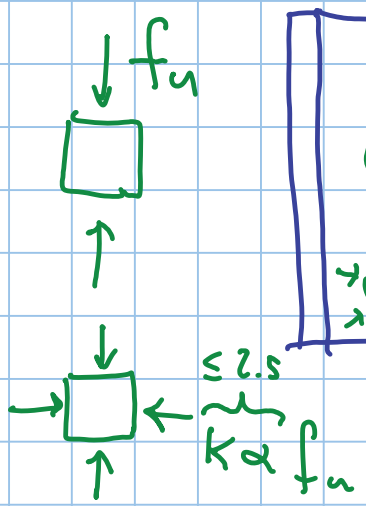
2 sezioni per bullone

resistenza a rifollamento

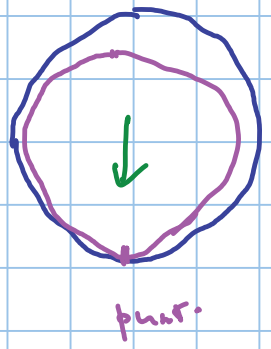
$$F_{b,Rd} = \frac{d\, t\, k_\alpha\, f_u}{\gamma_{M2}}$$

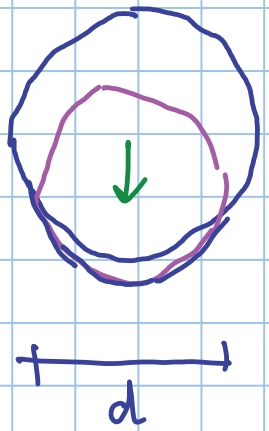
$k_\alpha \le 2.5$

≤ 1



RIFOLLAMENTO





$$F_{b,Rd} = d\,t\,K\,\alpha\,\frac{f_u}{\gamma_{M2}}$$

$$K = MIN\left(\frac{2.8\,e_2}{d_0} - 1.7\ ;\ \frac{1.5\,p_2}{d_0} - 1.7\ ;\ 2.5\right)$$

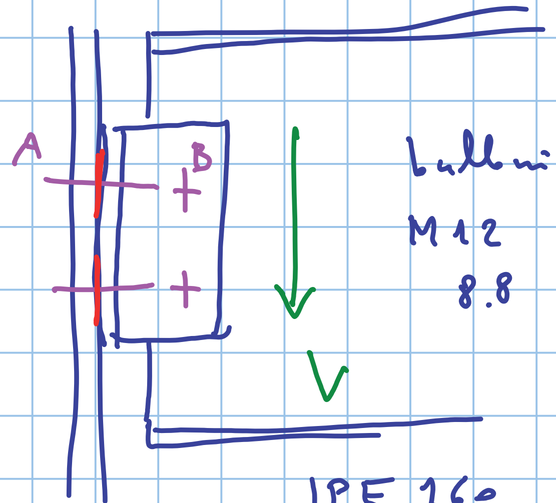
$$\frac{2.8\,e_2}{d_0} - 1.7 = 2.5 \qquad e_2 = \frac{2.5 + 1.7}{2.8}\,d_0 = 1.5\,d_0$$

con $e_2 = 1.2\,d_0$ $\qquad p_2 = 3\,d_0$

$$\frac{2.8 \times 1.2\,d_0}{d_0} - 1.7 = 1.66$$

$$\alpha = MIN\left(\frac{l_1}{3\,d_0}\ ;\ \frac{p_1}{3\,d_0} - 0.25\ ;\ \frac{f_{u3}}{f_u}\ ;\ 1\right)$$

COLLEGAM. B



bulloni
M12
8.8

IPE 160
S 275

angolari
L 60x60x6
S275

$A_v = 9.66 \times 10^2\ mm^2$

$t_w = 5\ mm$

$V_{Ed} = \cancel{140}\ KN$ → 90

$V_{Rd} = \frac{9.66 \times 10^2 \times 275}{1.05} =$

$= 253\ KN$

anima $t_w = 5\ mm$

angolari $t = 2 \times 6 = 12\ mm$

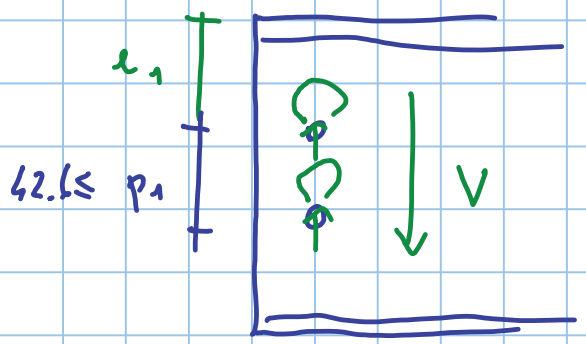
rifollamento anima

$F_{b,Rd} = 12 \times 5\ k\alpha\ \frac{430}{1.2} = 21.5\ k\alpha$ (with $k\alpha \leq 2.5$) ≤ 53.8 kN

$F_{b,Ed} = \frac{V_{Ed}}{n_{fori}} = \frac{\cancel{140}\ 90}{2} = \cancel{70}\ 45$ KN   NO

$K\alpha \geq \frac{45}{21.5} = 2.09$

$K = 2.5$ $\alpha \geq \frac{2.09}{2.5} = 0.837$



$$\frac{e_1}{3\,d_0} \geq 0.837 \qquad e_1 \geq 2.511\,d_0 = 32.6\ mm$$

$$\frac{p_1}{3\,d_0} - 0.25 \geq 0.837 \qquad p_1 \geq 3.261\,d_0 = 42.4\ mm$$

BULLONI A

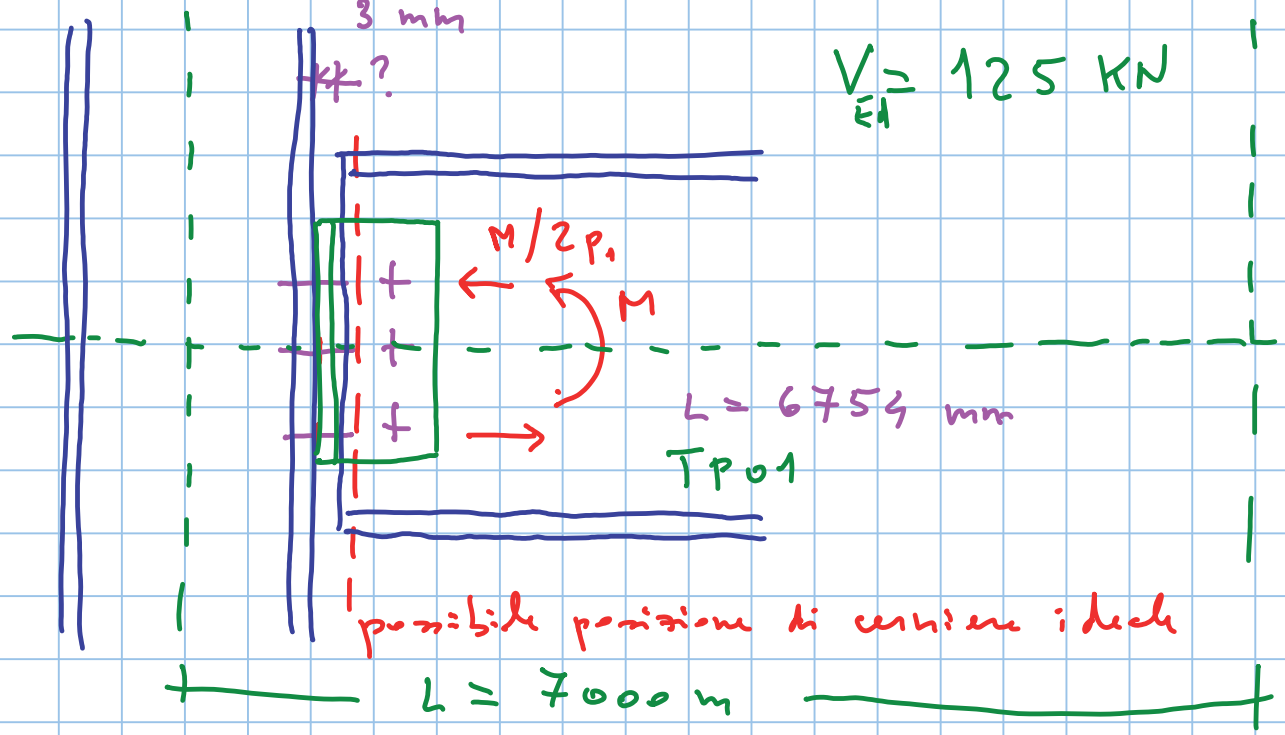
ala colonna $t_f = 9\ mm$

anglare $t = 6\ mm$

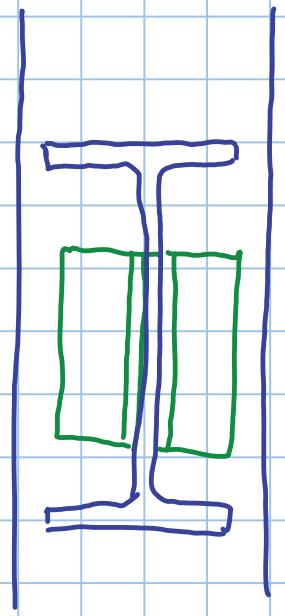
$$F_{b,Rd} = 12 \times 6\ kN\ \frac{430}{1.2} = 25.8\ kN$$

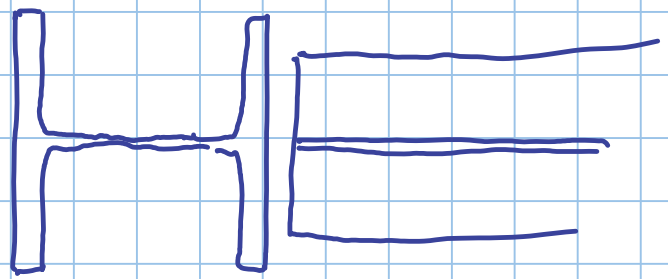
$$F_{b,Ed} = \frac{90}{4} = 22.5\ kN$$

bastano utilizzare le distanze minime di normativa



$V_{Ed} = 125$ kN





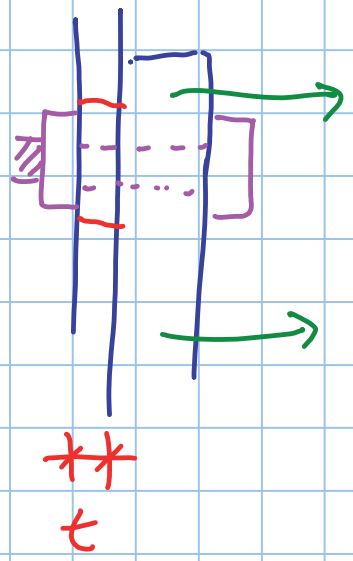
IPE 400

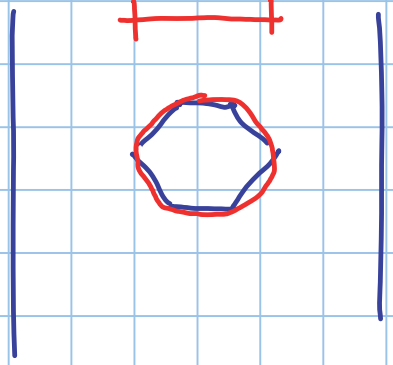
HE 240 B

bulloni a trazione

$$F_{t,Rd} = 0.9 \, A_{res} \, \frac{f_{ub}}{\gamma_{M2}}$$

punzonamento





diametro medio testa bullone

$$d_m \simeq 1.6 \, d$$

$$B_{p,Rd} = 0.6 \, \pi \, d_m \, t \, \frac{f_u}{\gamma_{M2}}$$

bulloni a taglio - collegamento ad attrito

resistenza

$$F_{s,Rd} = \mu \frac{F_{p,cd}}{\gamma_{M3}}$$

μ coeff. attrito da 0.2 a 0.5

serraggio

$$F_{p,cd} = 0.7 \, A_{res} \frac{f_{ub}}{\gamma_M}$$