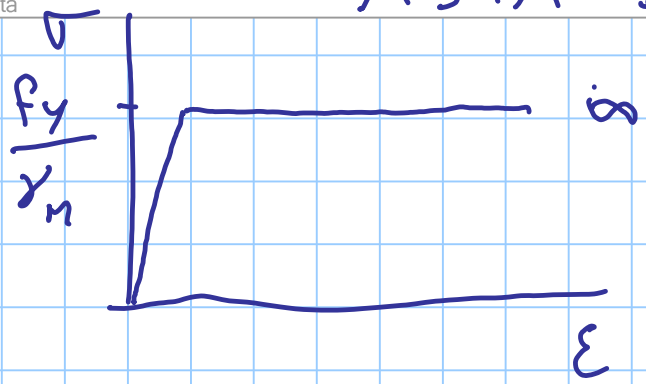
Titolo nota 18/10/2017

ASTA o sezione



verifiche di resistenza

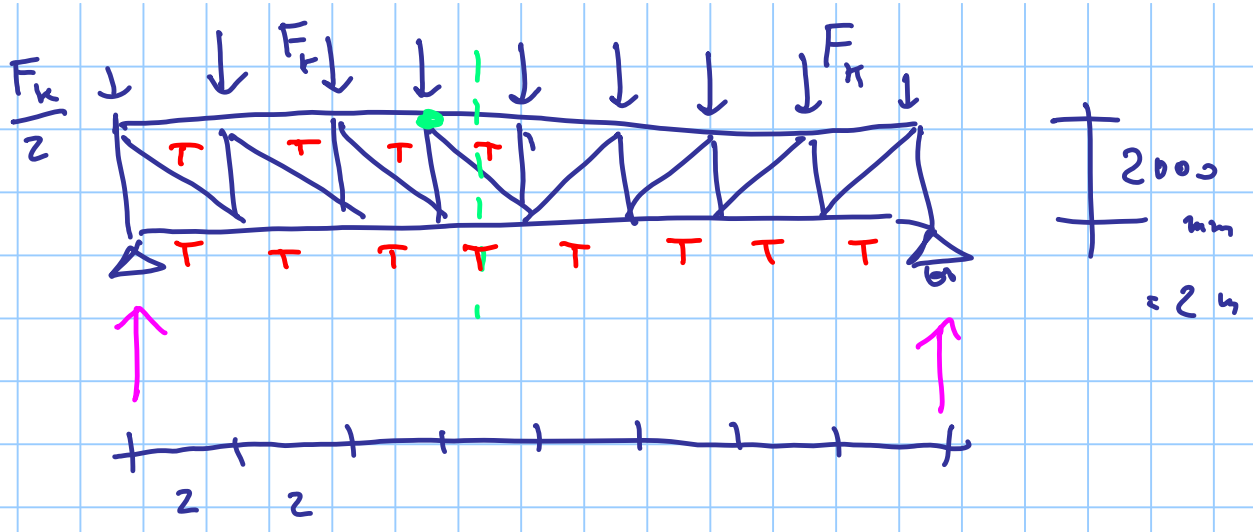
$\gamma_{M1} = 1.05$

casi particolari (aste forate)

$\frac{f_u}{\gamma_{M2}}$

$\gamma_{M2} = 1.25$

TRAZIONE



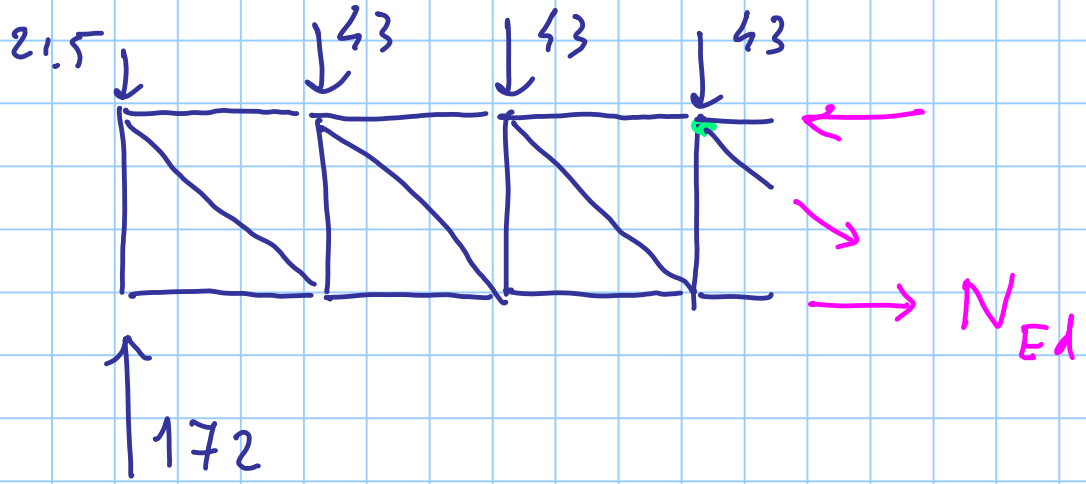
$F_k = 10\ KN$ permen. G_k

$20\ KN$ variab. Q_k

$G_d = G_k \gamma_G = 10 \times 1.3 = 13\ KN$

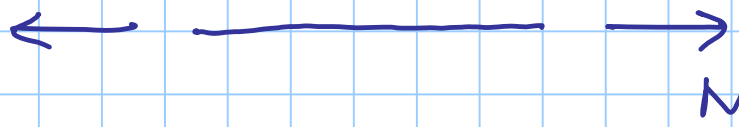
$Q_d = Q_k \gamma_Q = 20 \times 1.5 = 30\ KN$

F_d $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ $43\ KN$



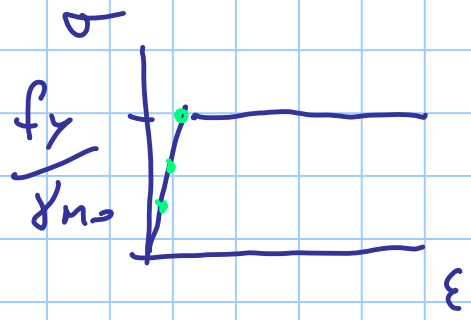
$$-(172-21.5)\times 6 + 43\times 4 + 43\times 2 + N_{Ed}\times 2 = 0$$

$$N_{Ed} = \frac{150.5\times 6 - 43\times 4 - 43\times 2}{2} = 322.5\ KN$$



campo elastico

$\sigma = E\,\varepsilon$



$\varepsilon = \frac{N}{EA}$ $\quad \sigma = \frac{N}{A}$

$$N_{Rd} = A\,\frac{f_y}{\gamma_{M0}}$$

VERIFICA $\quad N_{Ed} \leq N_{Rd}$

ASTA 2 L 50×50×6 S 275

L 50×50×6 → $A = 5.69 \times 10^2 \ mm^2$

2L $A = 11.38 \times 10^2 \ mm^2$

$$N_{Rd} = A \frac{f_y}{\gamma_{m0}} = 11.38 \times 10^2 \ \frac{275}{1.05} \times 10^{-3} = 298.0 \ KN$$

$N_{Ed} = 322.5 \ KN > N_{Rd}$ non verificata

$$N_{Ed} \leq N_{Rd} = A \frac{f_y}{\gamma_{M0}}$$

$$A \geq \frac{N_{Ed}\ \gamma_{M0}}{f_y} \qquad \text{ovv.} \qquad f_y \geq \frac{N_{ed}\ \gamma_{M0}}{A}$$

S275

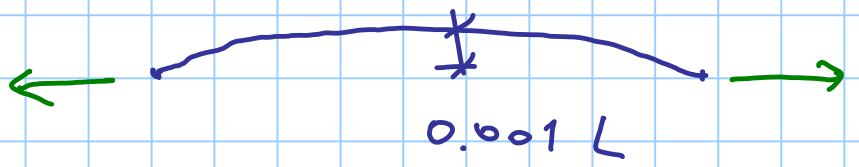
$$A \geq \frac{322.5 \times 10^3 \times 1,05}{275} = 12.31 \times 10^2\ mm^2$$

uso L 60×60×6 $A = 6.91 \times 10^2\ mm^2$ ving. & m.f. $6.16 \times 10^2\ mm^2$

comportamento teorico e reale

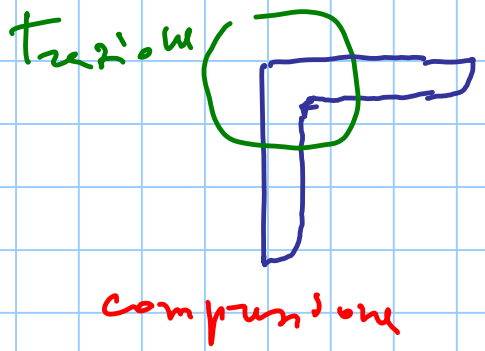
IMPERFEZIONI

geometriche



meccaniche

raffreddamento non uniforme



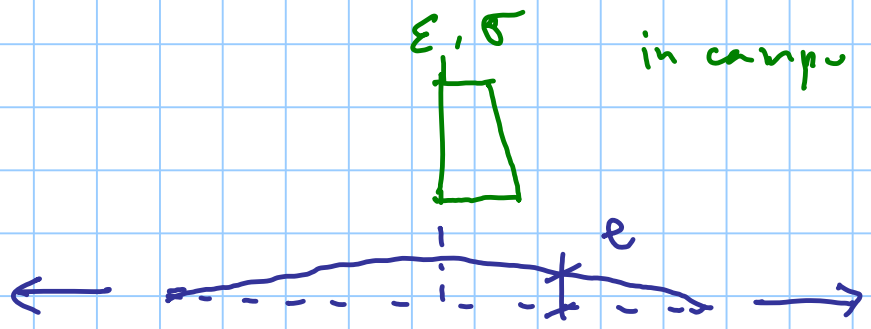
le estremità si raffreddano per prime

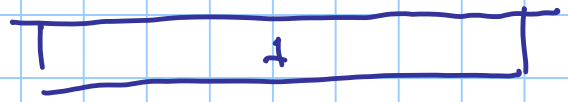
la parte di raccordo si raffredda (e accorcia)

quando gli estremi sono consolidati,

AUTOTENSIONI — TENSIONI RESIDUE

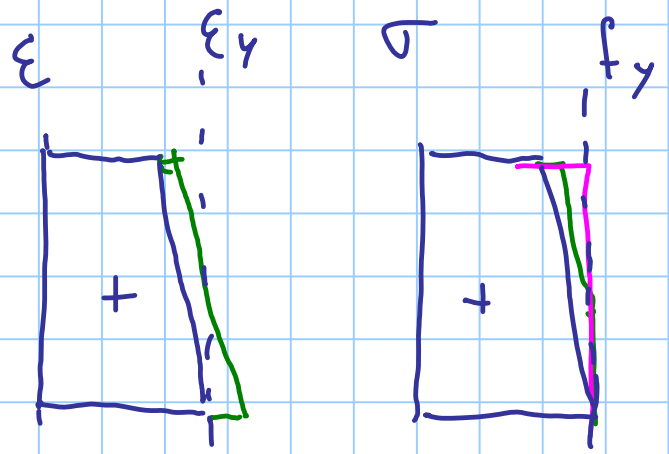
Quale effetto delle imperfezioni per asta tesa?





$N = F$

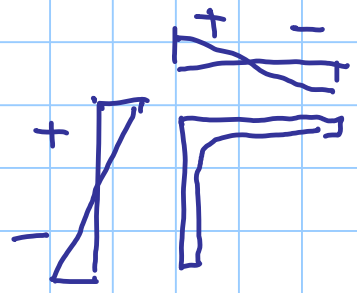
$M = Fe$

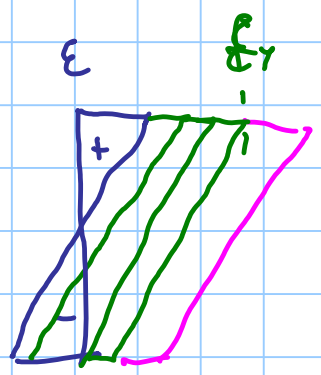


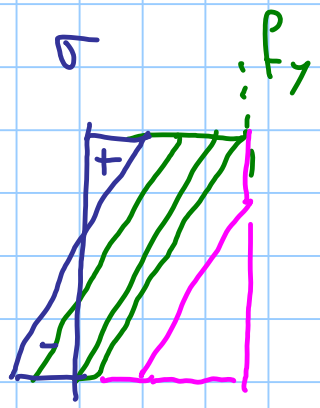
asta non rettilinea

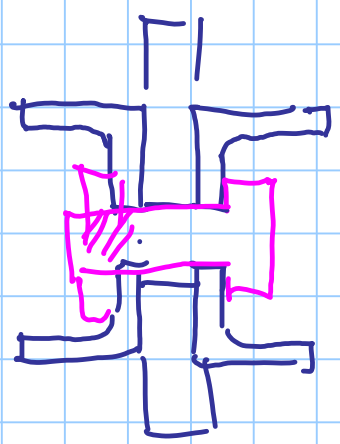
$$N_{Rd} = A \frac{f_y}{\gamma_{M0}}$$

TENSIONI RESIDUE



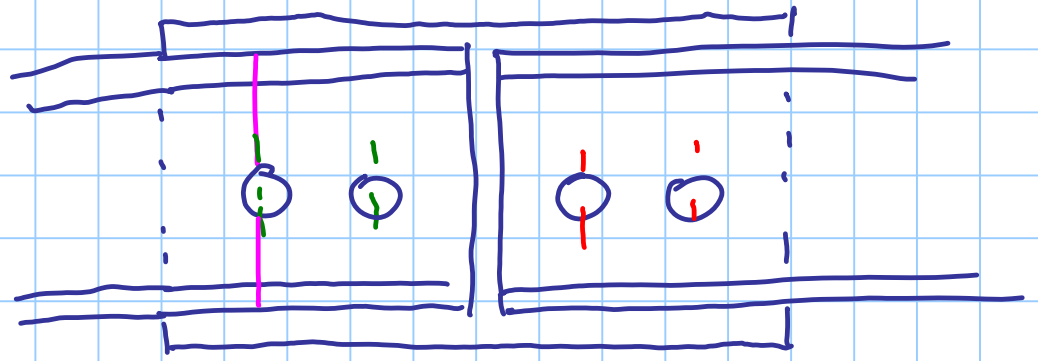






2 UPE 100

verifica sezione forata



F

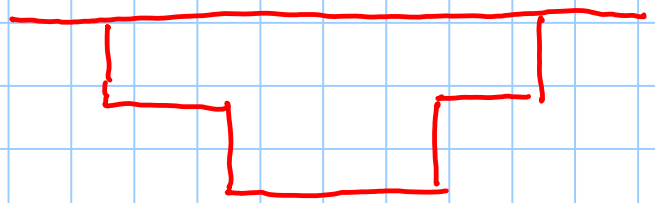
2 UPE 100

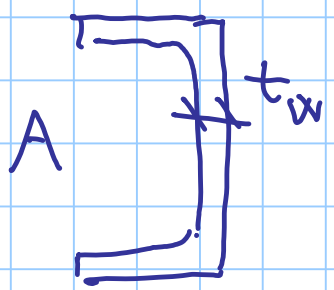
2 UPE 100

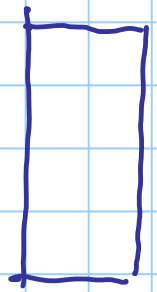
$N_{antr.}$

$N = F$

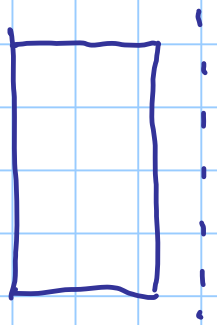
N_{picc}

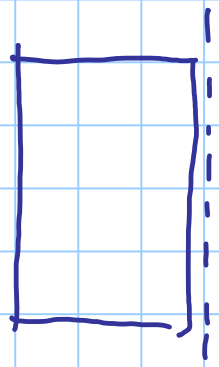


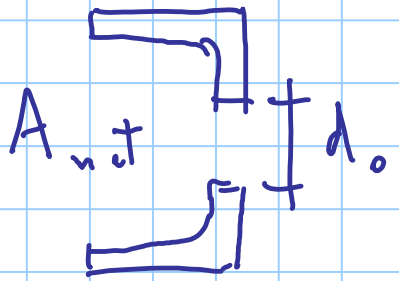


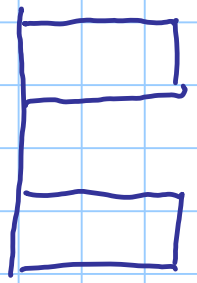


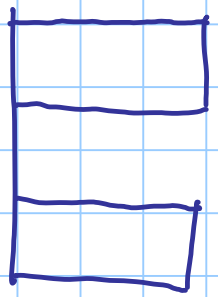
$$\sigma = \frac{F}{A}$$

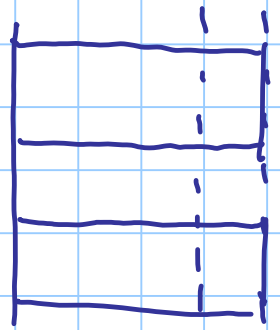












$$\sigma' = \frac{F}{A_{net}} > \sigma$$

$$\frac{f_y}{\gamma_{M0}}$$

f_y f_u

$$A_{net} \simeq A - d_0 t_w$$

$$N_{u,Rd} \simeq 0.9 A_{net} \frac{f_u}{\gamma_{M2}}$$

sezione standard $\quad N_{pl,Rd} = A \dfrac{f_y}{\gamma_{M0}}$

sezione forata $\quad N_{u,Rd} = 0.9\, A_{net} \dfrac{f_u}{\gamma_{M2}}$

$$N_{Rd} = MIN\left(N_{pl,Rd} \; ; \; N_{u,Rd} \right)$$

$N_{pl,Rd} < N_{u,Rd}$ COMPORT. DUTTILE

$N_{u,Rd} < N_{pl,Rd}$ " FRAGILE