

2 UPN 120

S 275

$$A = 34.0 \text{ cm}^2$$

$$N_{RA} = \frac{A f_y}{\gamma_{mo}} = \frac{34 \times 10^2 \times 275}{1.05} \times 10^{-3} = 890.5 \text{ kN}$$

dalla norma

$$\text{sup } N_{Ed} = -261 \text{ kN}$$

$$\text{inf. } N_{Ed} = +244 \text{ kN}$$

$$l_0 = 2437 \text{ mm} \Rightarrow 2 \text{ UPN 120}$$

2 UPN 80

2 UPN 80

$$A = 22.04 \text{ cm}^2$$

CORR. INF

a Tension

$$N_{rd} = \frac{A f_y}{\gamma_{m0}} = 577.2 \text{ kN}$$

vento

coll. inf

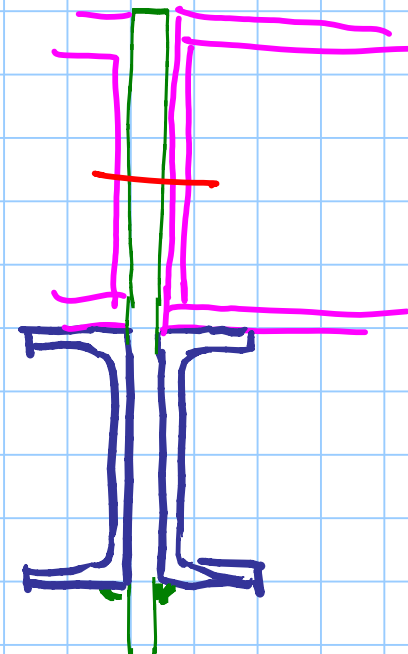
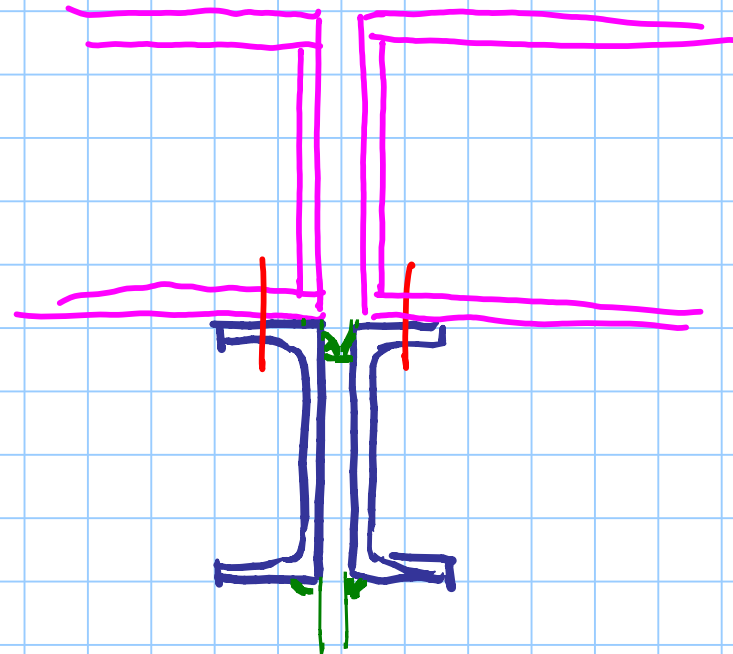
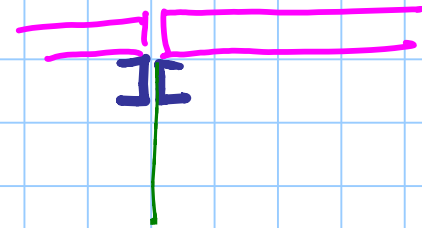
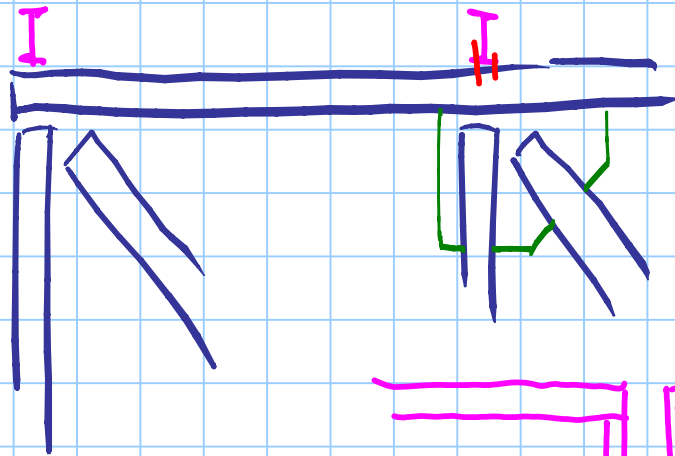
$$N_{ed} = -66.3 \text{ kN}$$

$$\chi > \frac{66.3}{577.2} = 0.115$$

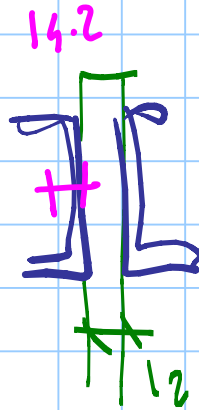
potui accettare

$$\bar{\lambda} \approx 2.5$$

$$\lambda = 215$$



2 UPN 80



1 UPN 80

$$i_y = 3.10 \text{ cm}$$

$$i_z = 1.33 \text{ cm}$$

$$I_2 = 2 \left[I_1 + A d^2 \right] = 2 \left[19.4 + 11.02 \times 2.02^2 \right] = 128.7 \text{ cm}^4$$

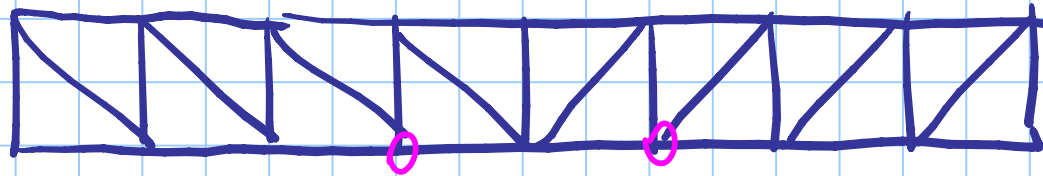
$$A = 22.04 \text{ cm}^2$$

$$i_z = \sqrt{\frac{128.7}{22.04}} = 2.42 \text{ cm}$$

$$\lambda_2 = 180 \text{ nicht ab}$$

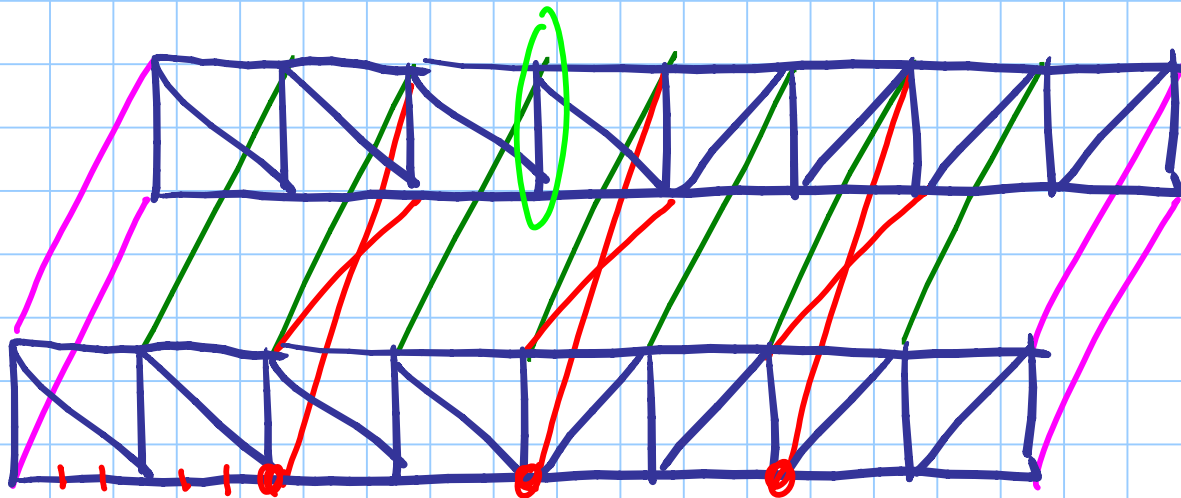
$$l_0 = \lambda i = 180 \times 2.42 = 436 \text{ cm}$$

$$\frac{l_0}{i}$$



4874 mm

2437 mm



VERIFICA con $l_0 = 4874 \text{ mm}$

single
 $l_0 = \frac{4874}{6} = 812 \text{ mm}$

$$\lambda_2 = \frac{4874}{24.2} = 201.4$$

$$\lambda_1 = \frac{812}{13.3} = 61.1$$

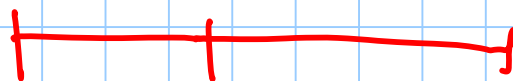
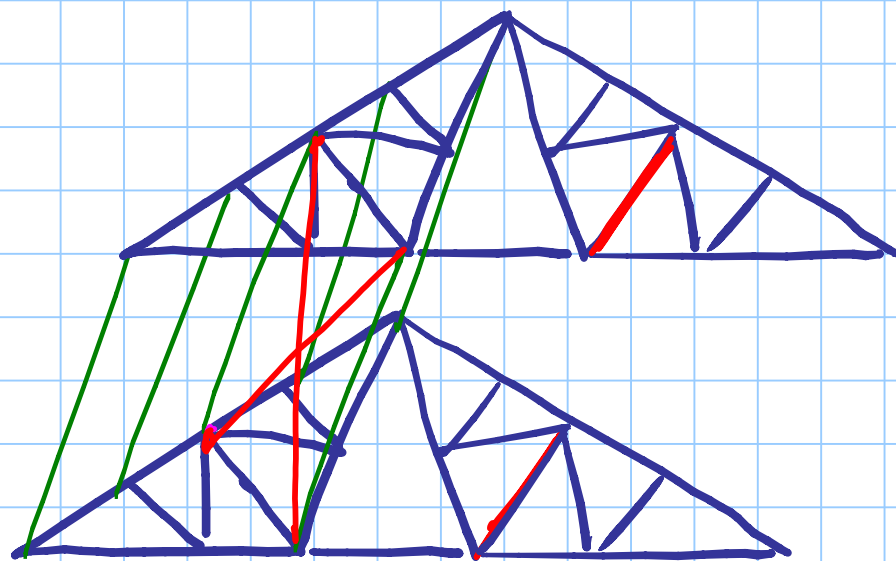
$$\lambda_y = \sqrt{201.4^2 + 61.1^2} = 210.5$$

$$\bar{\lambda} = \frac{210.5}{86} = 2.45$$

$$\chi = 0.14 \quad \text{OK}$$

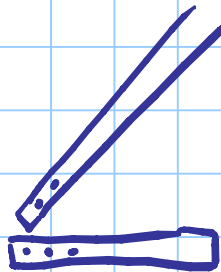
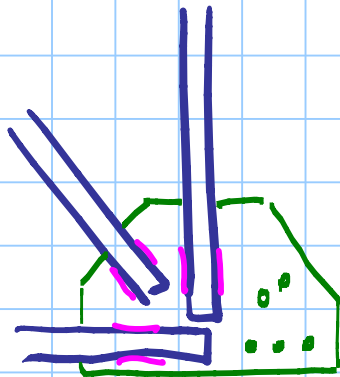
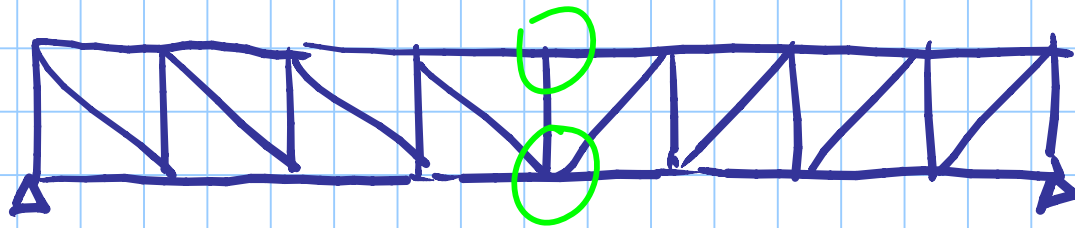
se usami 2 UPN 120 $i_{min} = 2.80 \text{ cm}$

$$\lambda = 250 \Rightarrow l_0 = 250 \times 2.80 = 700 \text{ cm}$$



ABBASSAMENTI

calcol con Td 2008

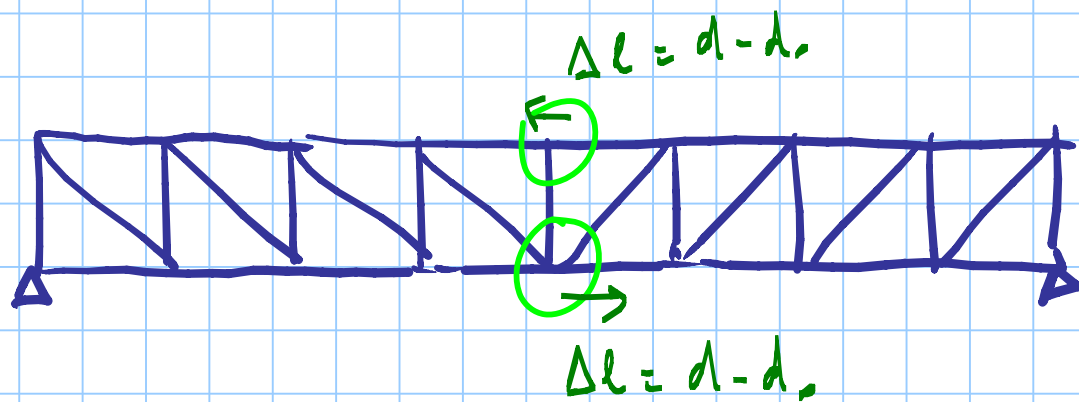


scoiiment. bruti
alle differenz.

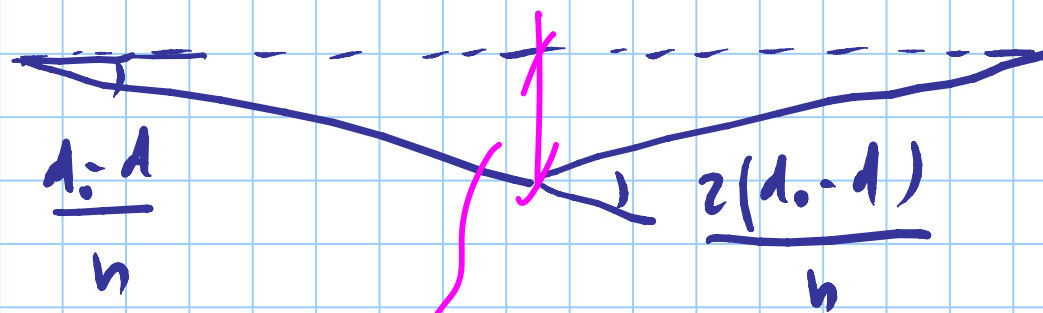
$d_0 - d$

↓
diametro di foro

↓
bullone



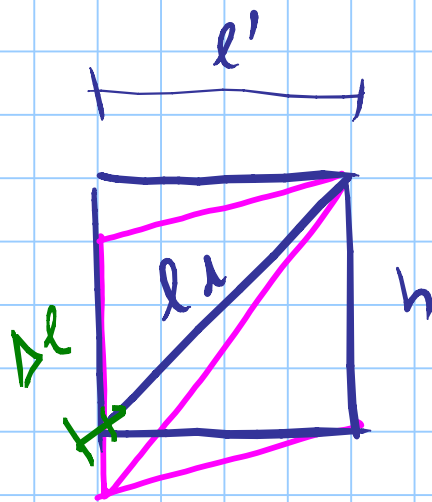
$$\frac{\Delta l}{h} = \frac{2 \Delta l}{h}$$



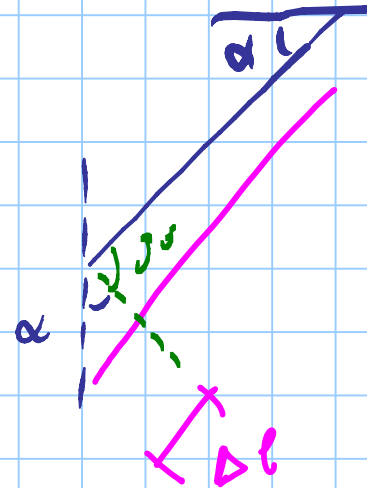
$$\frac{d_0 - d}{h} \cdot \frac{L}{2}$$

$$\sin \alpha = \frac{h}{l_d}$$

$$(d_0 - d) \frac{l_d}{h}$$



$$\frac{\Delta l}{\sin \alpha}$$



nel calcolo delle frecce occorre tenere conto delle deformazioni indotte da scorrimenti nei collegamenti bullonati. Ad esempio per una travatura reticolare si hanno ulteriori frecce dovuta agli scorrimenti nei correnti (δ_c) e nelle diagonali (δ_d) che possono essere valutate con le espressioni:

$$\delta_c = \frac{n}{6} \frac{L}{h} (d_0 - d)$$

$$\delta_d = \frac{L_d}{p} \frac{L}{h} (d_0 - d)$$

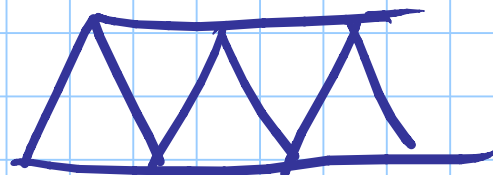
con

n = numero di giunti nei correnti

L_d = lunghezza delle aste diagonali

p = passo delle aste diagonali

$d_0 - d$ = gioco foro-bullone

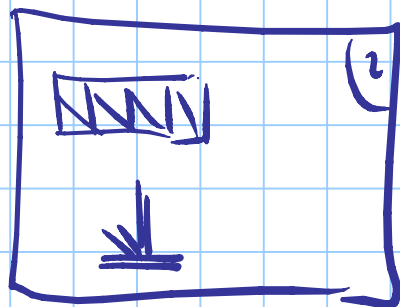


TAVOLA

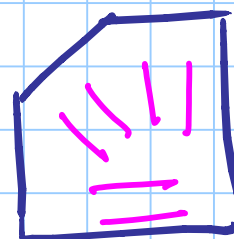
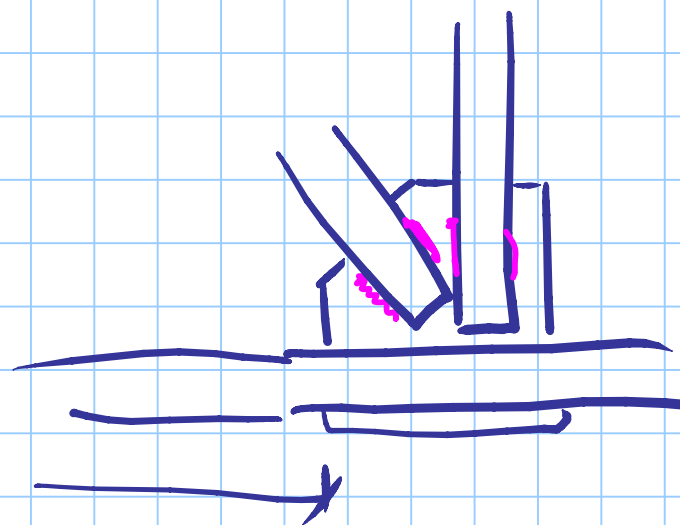


ring. di peri

per mezzo Trevi Tom



montepi
in officina



Tree

FINK

