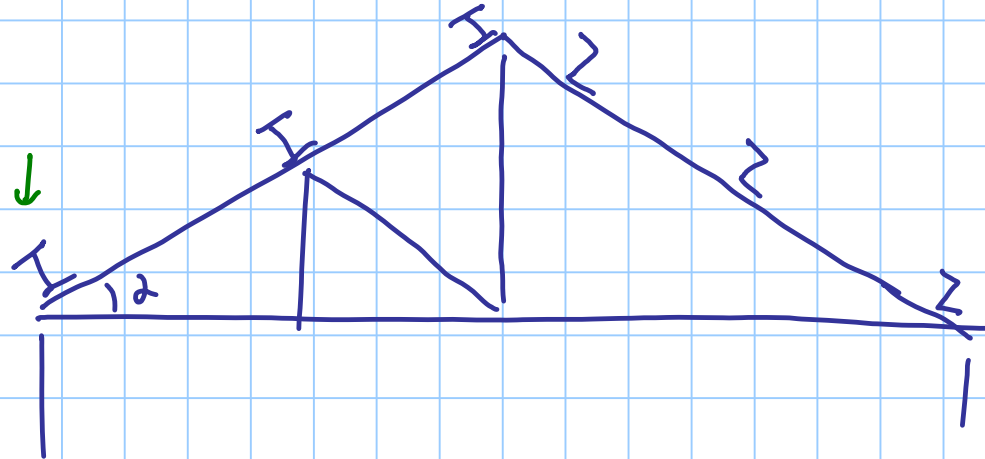
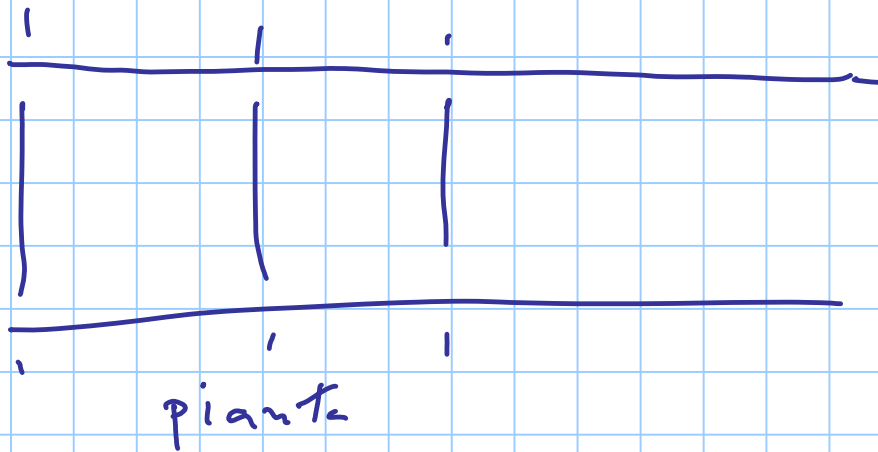


$$\alpha = 20^\circ$$



viste laterali

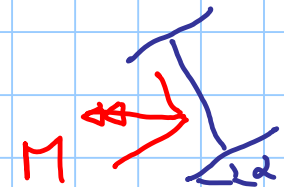
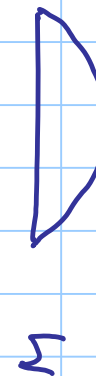


piante

in alternative a I

si usano  
profili a Z  
formati a freddo

$$M_{Ed, max} = 25 \text{ kNm}$$



$$M_y = M \cos \alpha$$

$$M_z = M \sin \alpha$$

$$M_{Ed,y} = 25 \text{ kNm} \rightarrow 20' = 23.5 \text{ kNm}$$

S 235

$$M_{Ed,z} = 25 \text{ kNm} \rightarrow 20' = 8.6 \text{ kNm}$$

se from flexion rule

$$M_{Ed,y} \leq M_{Rd,y} = W_{pl,y} \frac{f_y}{\gamma_m}$$

$$W_{pl,y} \geq \frac{M_{Ed,y} \gamma_m}{f_y} = \frac{23.5 \times 10^6 \times 1.05}{235} = 105 \times 10^3 \text{ mm}^3$$

$$W_{pl,z} \geq \frac{M_{Ed,z} \gamma_m}{f_y} = \frac{8.6 \times 10^6 \times 1.05}{235} = 38.4 \times 10^3 \text{ mm}^3$$

IPE 200

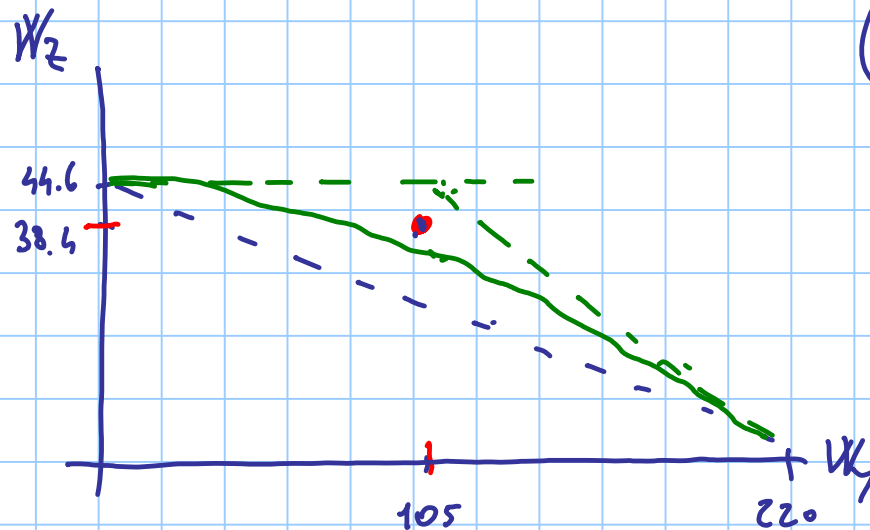
$$W_{pl,y} = 220.6 \times 10^3 \text{ mm}^3$$

$$m = 22.4 \text{ Kg/m}$$

$$W_{pl,z} = 44.61 \times 10^3 \text{ mm}^3$$

$$M_{Rd,y} = 220.6 \times 10^3 \times \frac{235}{1.05} \times 10^{-6} = 49.37 \text{ kNm} > 23.5$$

$$M_{Rd,z} = 44.61 \times 10^3 \times \frac{235}{1.05} \times 10^{-6} = 9.98 \text{ kNm} > 8.6$$



$$\left( \frac{23.5}{49.37} \right)^2 + \frac{8.6}{9.98} = 1.089 > 1$$

$$\downarrow$$
$$0.476^2$$
$$\downarrow$$
$$0.227$$

$$\downarrow$$
$$0.862$$

NON  
VERIFICATO

occorre almeno

IPE 220

$$m = 26.2 \text{ Kg/m}$$

prov HE 120 B

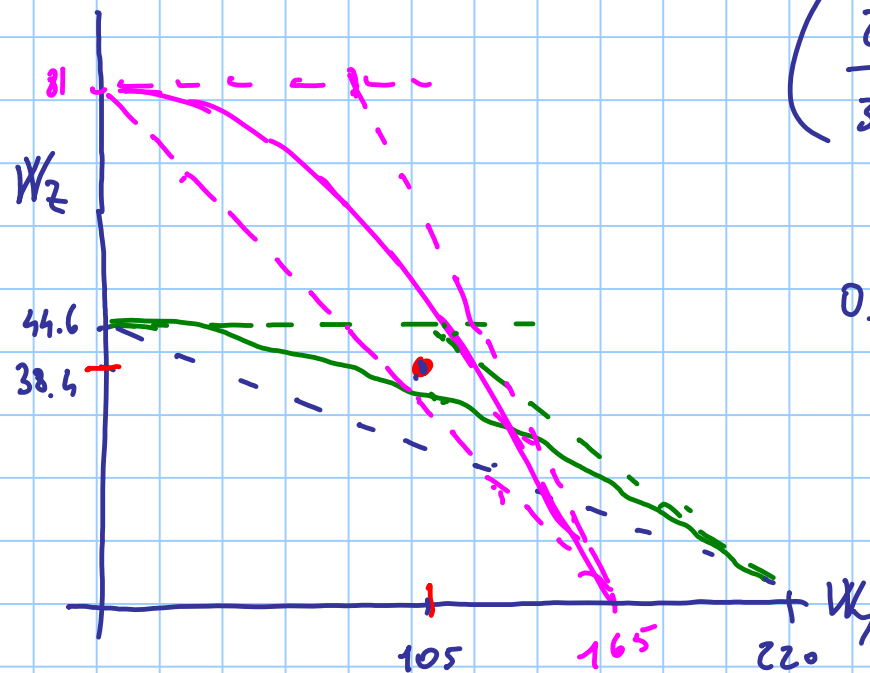
$$W_{pl,y} = 165.2 \times 10^3 \text{ mm}^3$$

$$m = 26.7 \text{ kg/m}$$

$$W_{pl,z} = 80.97 \times 10^3 \text{ mm}^3$$

$$M_{Rd,y} = \frac{165.2 \times 10^3 \times 235}{1.05} \times 10^{-6} = 36.97 \text{ kNm}$$

$$M_{Rd,z} = \frac{80.97 \times 10^3 \times 235}{1.05} \times 10^{-6} = 18.12 \text{ kNm}$$



$$\left( \frac{23.5}{36.97} \right)^2 + \frac{8.1}{18.12} = 0.879$$

$$\downarrow$$

$$0.636^2$$

$$\downarrow$$

$$0.404$$

$$\downarrow$$

$$0.475$$

OK

megli- HE 140 A

$$m = 24.7 \text{ kg/m}$$