Titolo nota 19/11/2014

ANALISI DEI CARICHI - TRAVE SECONDARIA

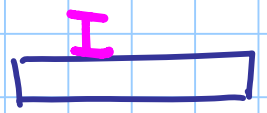
(già fatto)

	SLE		SLU	
	g_K	q_K	g_d	q_d
neve, vent., manut.	-	3,95	-	5.93
pannelli, travi	0,48	-	0.62	-
	4.43 kN/m		6.55 kN/m	

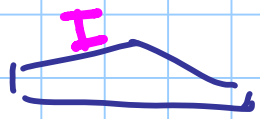
Lunghezza $L = 6.20$ m

CAPANNONE

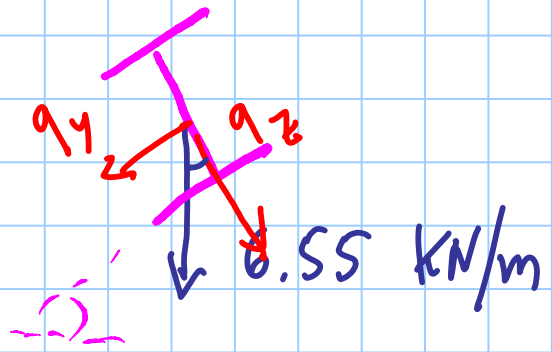
1, 2 copertura piana



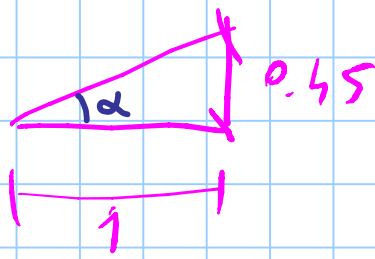
3 leggera pendenza



4 pendenza più rilevante



p = 45%



$tg\,\alpha = 0.45$

$\alpha = 24.2°$

$$q_z = q \cos\alpha = 5.97 \text{ kN/m}$$

$$q_y = q \sin\alpha = 2.69 \text{ kN/m}$$

$$M_{y,Ed} = \frac{q_z L^2}{8} = 28.69 \text{ kNm}$$

$$M_{z,Ed} = \frac{q_y L^2}{8} = 12.93 \text{ kNm}$$

dimensionamento SLU S 275

a flessione retta $M_{Rd} = W_{pl} \frac{f_y}{\gamma_{M0}} > M_{Ed}$

$$W_{pl} > \frac{M_{Ed}\ \gamma_{M0}}{f_y}$$

con $M_{y,Ed} \rightarrow W_{pl,y} \geq \frac{28.69 \times 1,05 \times 10^6}{275} = 109.5 \times 10^3\ mm^3$

con $M_{z,Ed} \rightarrow W_{pl,z} \geq 49.37 \times 10^3\ mm^3$

HE 120 A

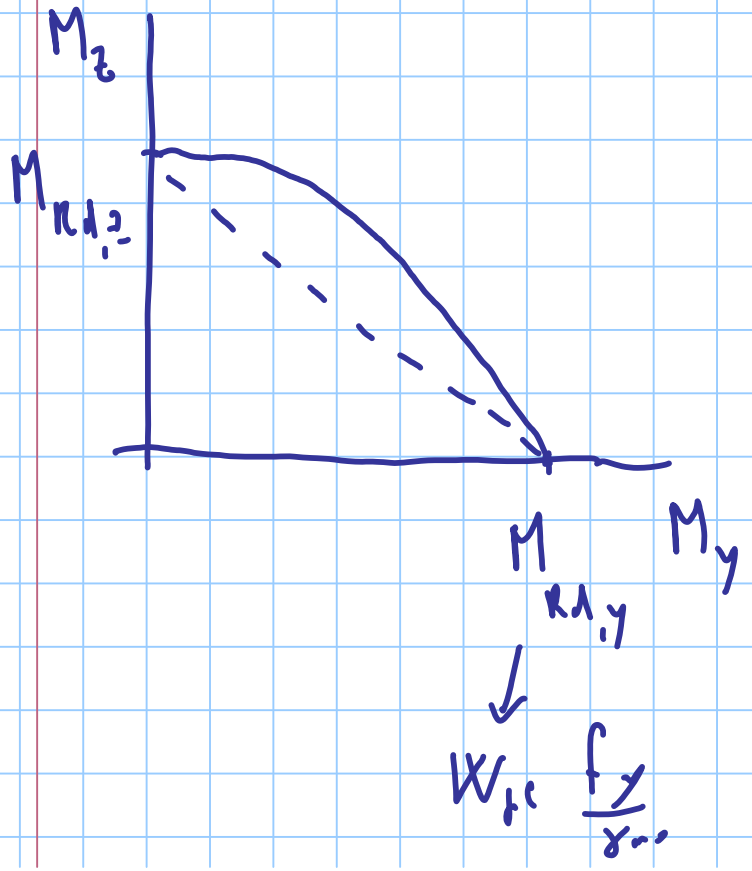
$W_{pl,y} = 119.5 \times 10^3 \ mm^3$

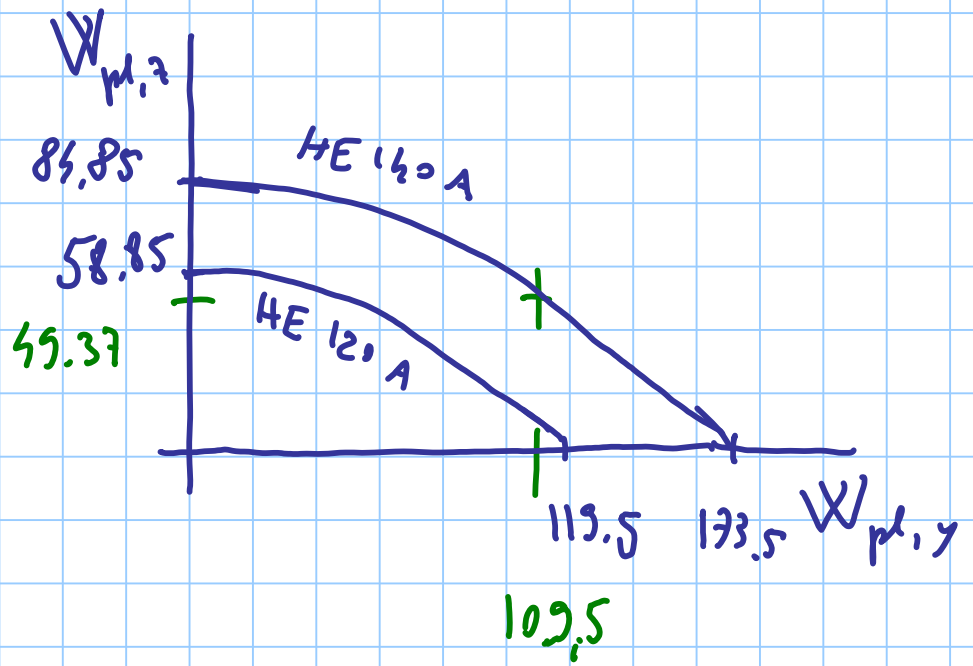
$W_{pl,z} = 58.85 \times 10^3 \ mm^3$

HE 140 A

$173.5 \times 10^3 \ mm^3$

$84.85 \times 10^3 \ mm^3$





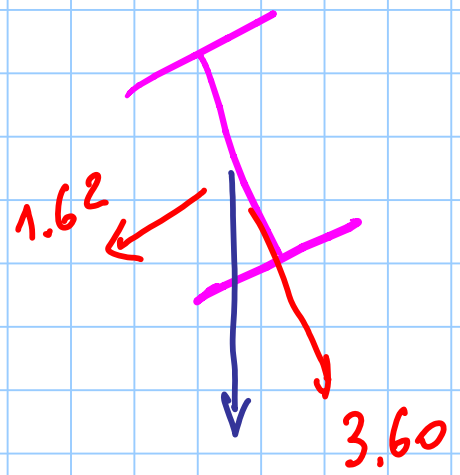
$$\left(\frac{M_{Ed,y}}{M_{Rd,y}}\right)^2 + \left|\frac{M_{Ed,z}}{M_{Rd,z}}\right| \leq 1$$

$$\left(\frac{W_{pl,y,mc}}{W_{pl,y}}\right)^2 + \left|\frac{W_{pl,z,mc}}{W_{pl,z}}\right| \leq 1$$

$$\left(\frac{109,5}{173,5}\right)^2 + \frac{49,37}{84,85} = 0.98 \leq 1$$

0,398 0.582

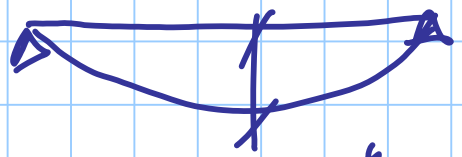
VERIFICA SLE - carichi variabili



$q_4 = 3{,}95$ kN/m

$$\frac{5}{384}\frac{qL^4}{EI} \leq \frac{1}{250}L$$

$$I \geq \frac{5 \times 250}{384}\frac{qL^3}{E}$$



$$f = \frac{5}{384}\frac{qL^4}{EI}$$

per flessione retta

$$I_y \geq \frac{5 \times 250}{384} \cdot \frac{360 \times 6.2^3}{210\,000} \times 10^9 = 1330 \times 10^4 \ mm^4$$

$$I_z \geq \text{"} \cdot \frac{1.62 \text{ "}}{\text{"}} = 598{,}5 \times 10^4 \ mm^4$$

HE 140 A $\quad I_y = 1033 \times 10^4 \ mm^4$ $\quad$ NO

$I_z = 389.3 \times 10^4 \ mm^4$

HE 160 A $\quad 1673 \times 10^4$

615.6×10^4

HE 180 A $\quad I_y = 2510 \times 10^4 \text{ mm}^4$

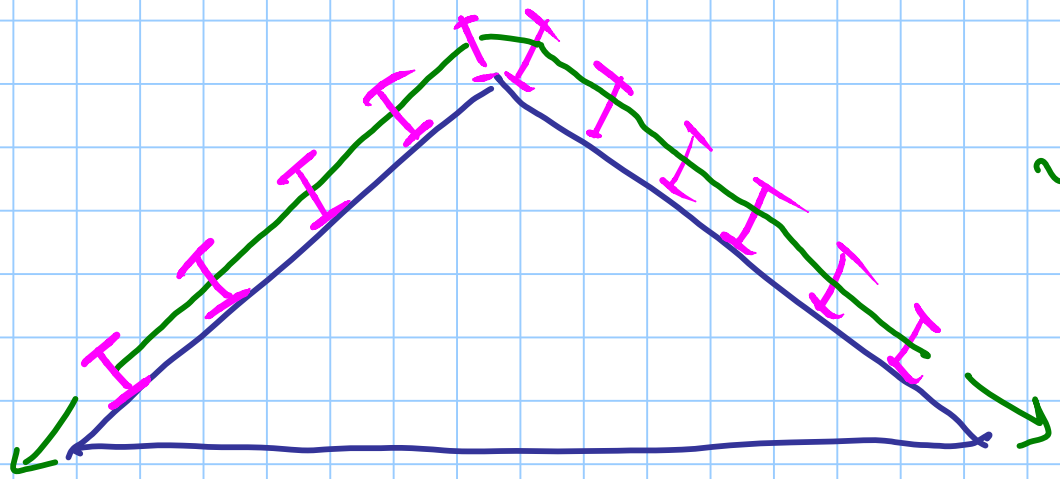
$I_z = 924.6 \times 10^4 \text{ mm}^4$

$$\delta_z = \frac{5}{384}\frac{q_z L^4}{E I_y} = \frac{5}{384}\frac{3.60 \times 6.20^4 \times 10^{12}}{210000 \times 2510 \times 10^4} = 13.14 \text{ mm}$$

$$\delta_y = \frac{5}{384}\frac{1,62 \times 6.20^4 \times 10^{12}}{210000 \times 924.6 \times 10^4} = 16.05 \text{ mm}$$

$$\delta = \sqrt{13.14^2 + 16.05^2} = 20.74 \text{ mm} < 24.8 \text{ mm}$$

$$\frac{L}{250} = \frac{6200}{250} = 24.8 \text{ mm}$$



vincoli
annulla δ_y
in mezzeria