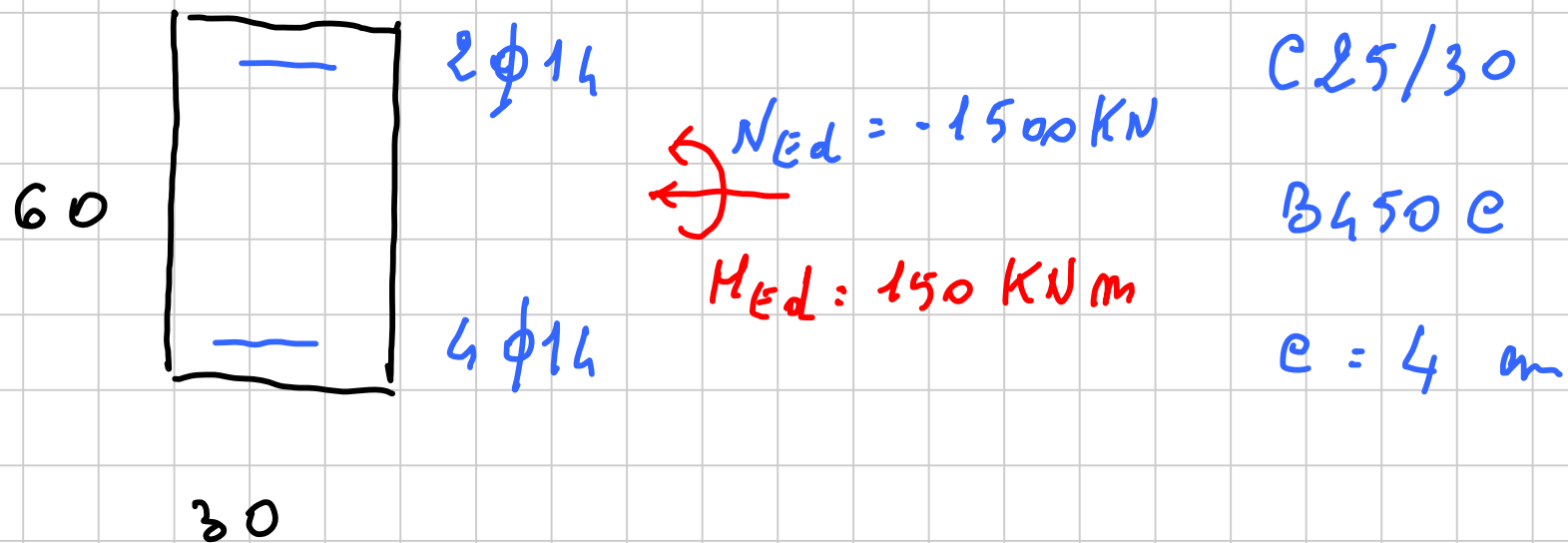
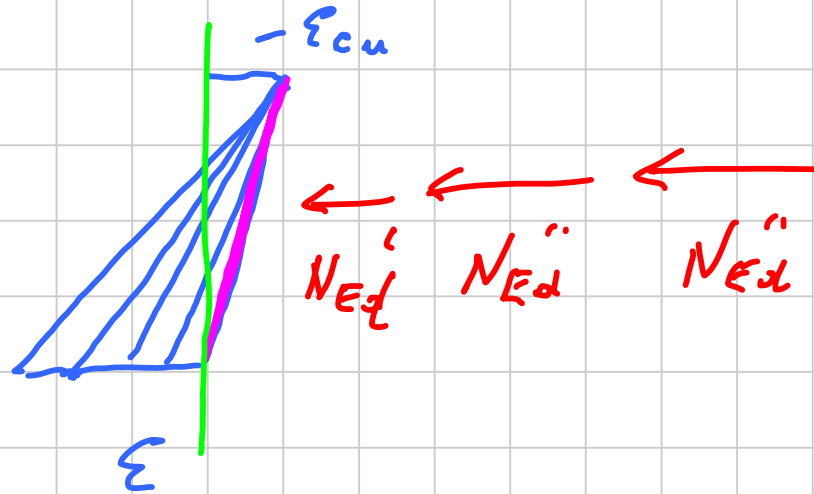
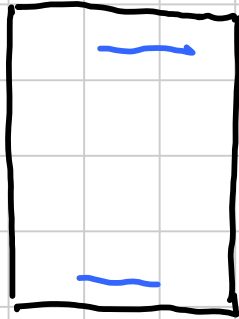


# FLESSIONE COMPOSTA

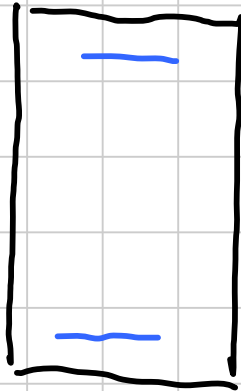
Titolo nota

29/04/2015





60



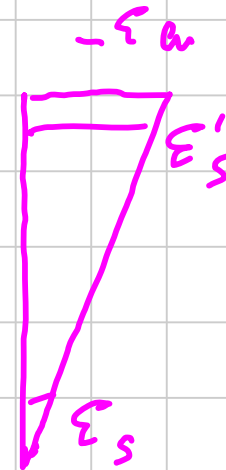
2  $\phi 14$

4  $\phi 14$

30

$$N_c + N_s + N'_s$$

$N_{Ed} = -1500 \text{ kN}$   
 $M_{Ed} = 150 \text{ kNm}$



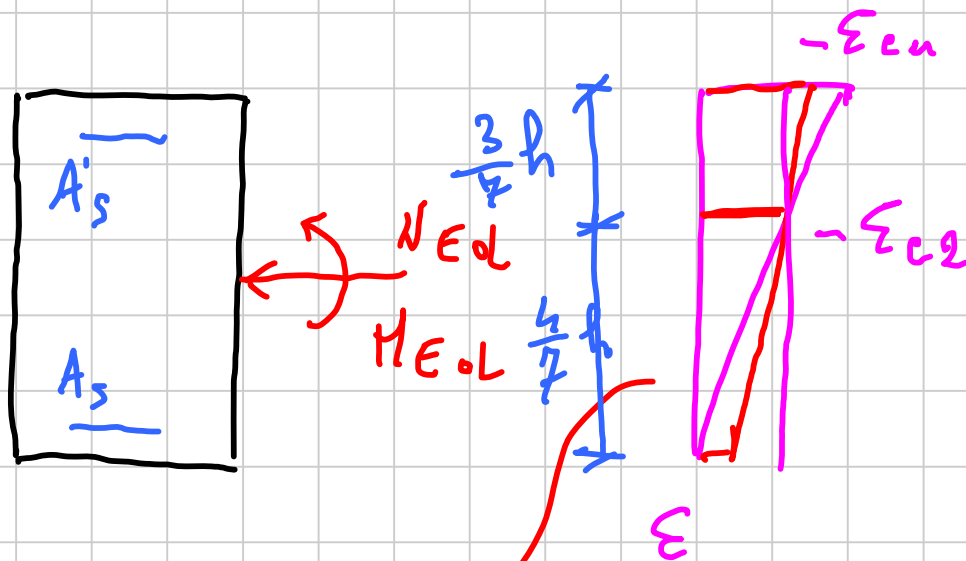
FILE HOME INSERISCI LAYOUT DI PAGINA FORMULE DATI REVISIONE VISUALIZZA SVILUPPO COMPONENTI AGGIUNTIVI

Calibri 12 A<sup>+</sup> A<sup>+</sup> Testo a capo

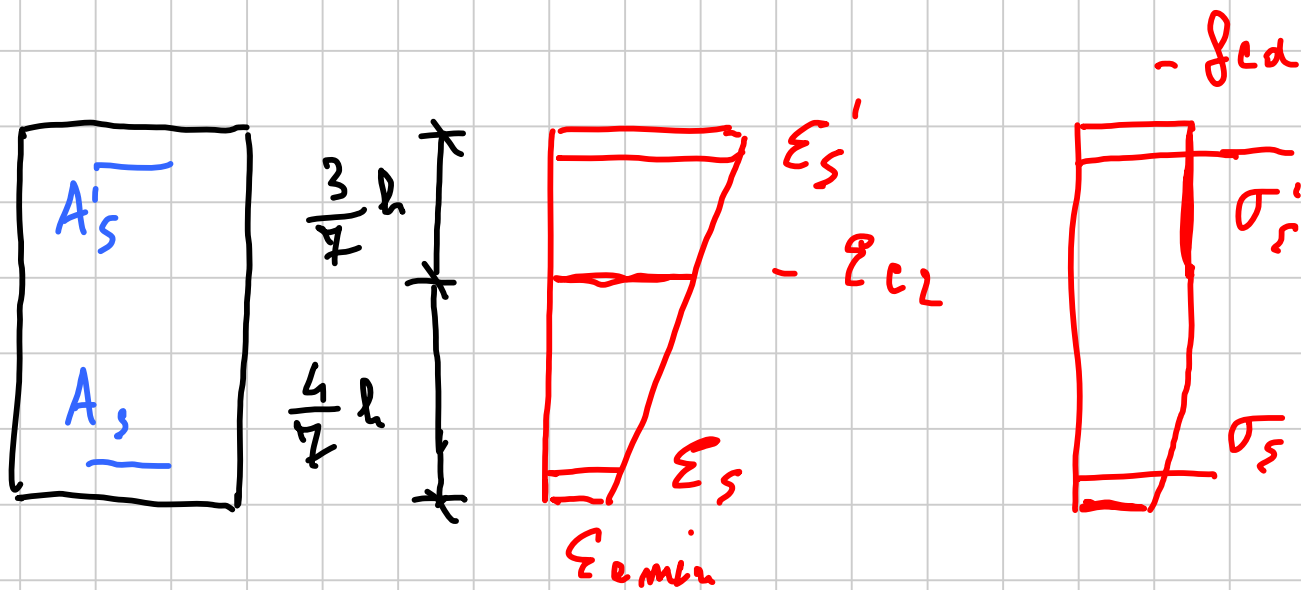
Incolla G C S Unisci e allinea al centro Numero % 000 0,00 0,00

Appunti Carattere Allineamento Numeri Stili

B10													
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	b	30 cm				fcd	14.2 Mpa						
2	h	60 cm				EpsC2	0.0020						
3	c	4 cm				EpsCu	0.0035						
4	d	56 cm											
5						fyd	391.3 Mpa						
6	AsP	3.08 cm <sup>2</sup>				Es	200000 Mpa						
7	As	6.16 cm <sup>2</sup>				EpsYd	0.001957						
8													
9						Beta	0.81						
10	X	43.6 cm				Kappa	0.416						
11													
12													
13													
14													
15					Nc	-1502.75 kN	Mc	178.5725 kNm					
16	EpsPS	-0.00318 SigmaSP	-391.3 NsP			-120.52 kN	MsP	31.3353 kNm					
17	EpsS	0.001001 SigmaS	200.1087 Ns			123.2669 kN	Ms	32.04941 kNm		Ned	-1500 kN		
18					N	-1500 kN	MRd	242.0 kNm		Med	150 kNm		



$$\frac{l}{\epsilon_{c2}} = \frac{h}{\epsilon_{cu}} \Rightarrow l = \frac{\epsilon_{c2}}{\epsilon_{cu}} h = \frac{4}{7} h$$

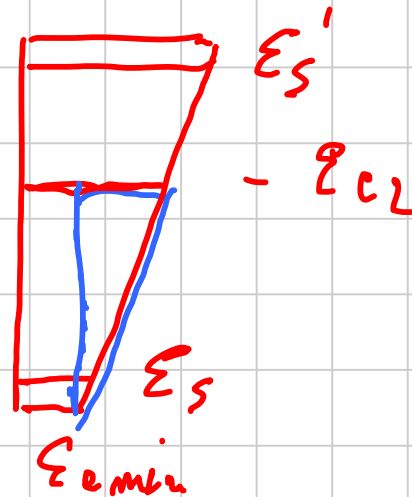
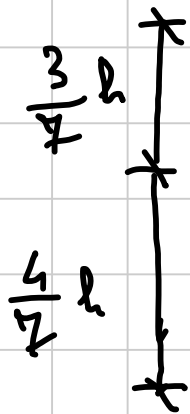
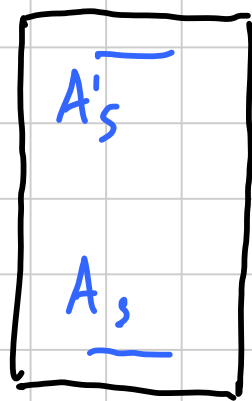


$$N_c = -\beta b h f_{cd}$$

$$\eta_{\min} = -\frac{\epsilon_{c,\min}}{\epsilon_{c2}}$$

$$\beta = 1 - \frac{4}{21} (1 - \eta_{\min})^2$$

$$0 \leq \eta_{\min} \leq 1$$



$$\frac{\epsilon_s - \epsilon_{c,min}}{\cancel{c}} = \frac{-\epsilon_{c2} - \epsilon_{c,min}}{\frac{h}{4}} c$$

$$\epsilon_s = \epsilon_{c,min} + \frac{c}{\frac{h}{4}h} (-\epsilon_{c2} - \epsilon_{c,min}) = \epsilon_{c2} \left[ \frac{\epsilon_{c,min}}{\epsilon_{c2}} - \frac{c}{\frac{4}{4}h} \left( 1 + \frac{\epsilon_{c,min}}{\epsilon_{c2}} \right) \right]$$

$$\epsilon_s = \epsilon_{c2} \left[ -\eta_{min} - \frac{c}{\frac{4}{7}h} (1 - \eta_{min}) \right]$$

$$\epsilon_s = -\epsilon_{c2} \left[ \eta_{min} + \frac{c}{\frac{4}{7}h} (1 - \eta_{min}) \right]$$

$$\epsilon'_s = -\epsilon_{c2} \left[ \eta_{min} + \frac{d}{\frac{4}{7}h} (1 - \eta_{min}) \right]$$

$$\epsilon'_s \leq \epsilon_s \leq -\epsilon_{yd} \quad \sigma'_s \leq \sigma_s = -f_{yd}$$

$$\epsilon'_s \leq \epsilon_s < -\epsilon_{yd} \quad \sigma'_s \leq \sigma_s = \frac{\epsilon_s}{\epsilon_{yd}} f_{yd}$$



$$N'_s = A'_s \sigma'_s$$

$$N_s = A_s \sigma_s$$

$$N_c + N'_s + N_s = N_{Ed}$$

equazioni da risolvere  
per determinare  $\eta_{min}$

$$M_{Rd} = -N_c \left( \frac{h}{2} - \kappa h \right) - N'_s \left( \frac{h}{2} - e \right) + N_s \left( \frac{h}{2} - e \right)$$

$$0.416 \leq \kappa \leq \frac{1}{2}$$

$$\kappa = \frac{\frac{1}{2} \left( 1 - \frac{16}{49} (1 - \eta_{min})^2 \right)}{1 - \frac{4}{21} (1 - \eta_{min})^2}$$

FILE HOME INSERISCI LAYOUT DI PAGINA FORMULE DATI REVISIONE VISUALIZZA SVILUPPO COMPONENTI AGGIUNTIVI

Incolla Calibri 12 A A Testo a capo Generale

G C S Unisci e allinea al centro % 000 0,00 0,00

Appunti Carattere Allineamento Numeri Stili

Formattazione condizionale Formatta come tabella Stili cella

N21													
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	b	30 cm				fcd	14.2 Mpa						
2	h	60 cm				EpsC2	0.0020						
3	c	4 cm				EpsCu	0.0035						
4	d	56 cm											
5						fyd	391.3 Mpa						
6	AsP	3.08 cm2				Es	200000 Mpa						
7	As	6.16 cm2				EpsYd	0.001957						
8													
9						Beta	0.866661						
10	EtaMin	0.163322 cm				Kappa	0.445052						
11													
12													
13													
14													
15					Nc	-2215.19 kN	Mc	73.03171 kNm					
16	EpsPS	-0.00306	SigmaSP	-391.3	NsP	-120.52 kN	MsP	31.3353 kNm					
17	EpsS	-0.00052	SigmaS	-104.374	Ns	-64.2942 kN	Ms	-16.7165 kNm		Ned		-2400 kN	
18					N	-2400 kN	MRd	87.7 kNm		Med		150 kNm	

