

$$\begin{aligned} N_6 &= P \\ N_5 &= N_6 + P = 2P \\ N_4 &= N_5 + P = 3P \\ &\vdots \\ N_1 &= N_2 + P = 6P \end{aligned}$$

PER PROGETTARE DEVO
CONOSCERE N_{ed}

$$\begin{cases} N_{Rd} = A_c f_{cd} + A_s f_{yd} \\ N_{Rd} = N_{ed} \end{cases} \Rightarrow N_{ed} = A_c f_{cd} + A_s f_{yd}$$

NTC18 $\Rightarrow A_s f_{yd} \geq 0.1 N_{ed}$

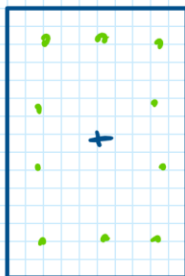
QUINDI POTREI RICAVERE:

$$A_c \geq \frac{0.9 N_{ed}}{f_{cd}}$$

$$A_s \geq \frac{0.1 N_{ed}}{f_{yd}}$$

DOBBIAMO TENER CONTO ANCHE DI:

1)



=>



$I_{e N_{ed}}$

$$e \geq 20 \text{ mm}$$

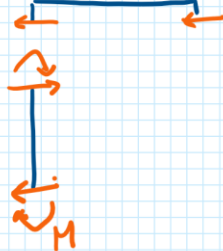
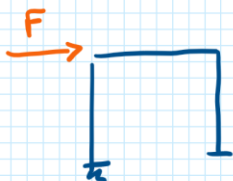
$$(e \geq 0.05 h_{\text{sez}}) \text{ NTC 08}$$

$$e \geq \frac{1}{200} H_L \text{ NTC 18} \rightarrow M_{\text{Ed}} = N_{\text{Ed}} \cdot e$$

$$\Rightarrow \text{PROGETTO PER } N_{\text{Ed}} \cdot 1.2 \Rightarrow A_c \geq \frac{N_{\text{Ed}}}{f_{\text{cd}}}$$

$$A_s \geq 0.2 \frac{N_{\text{Ed}}}{f_{\text{yd}}}$$

2) VENTO



$$A_c \geq 1.2 \frac{N_{\text{Ed}}}{f_{\text{cd}}}$$

$$A_s \geq 1.2 \cdot 0.2 \frac{N_{\text{Ed}}}{f_{\text{yd}}}$$

PER TENER CONTO DEL VENTO

INDICAZIONI PRATICHE E MINIMI DA NORMATIVA

• SEZ. CLS MINIMA = 30x30

$$A_s \geq 0.1 \frac{N_{\text{Ed}}}{f_{\text{yd}}}$$

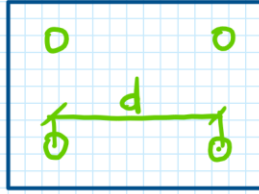
$$A_s \geq 0.6\% A_{c, \text{disp}}$$

$$A_s \geq 1.0\% A_{c, \text{disp}} \text{ (ZONA SISMICA)}$$

$$A_s \leq 4.0\% A_{c, \text{disp}} \text{ (ENORME)}$$

$$\phi_L \geq 12 \text{ mm} \rightarrow \text{noi usiamo } \phi 14 \text{ e } \phi 20$$

$$d \leq 30^{25} \text{ cm}$$



• STAFFE

$$\phi_{ST} \geq 6 \text{ mm}$$

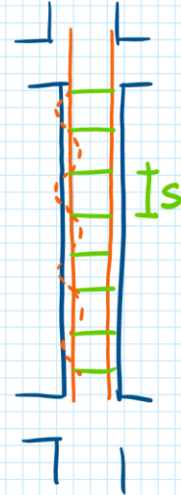
$$\phi_{ST} \geq \frac{1}{4} \phi_L$$

$$\Rightarrow \phi_{ST} = 8 \text{ mm}$$

$$S \leq 25 \text{ cm}$$

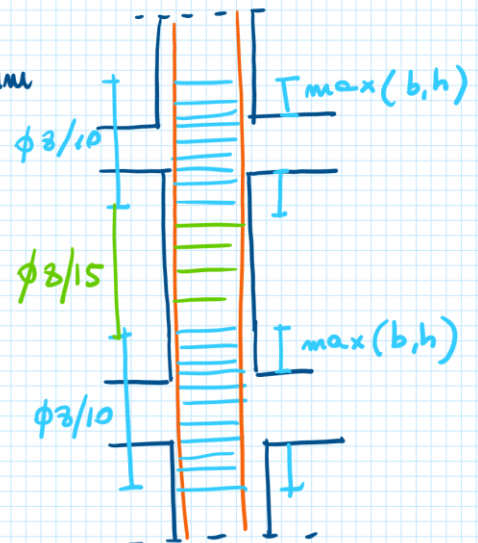
$$S \leq 12 \phi_{L \text{ min}}$$

(EC2) RAFFITURE $S \times 0.6$ AL NODO

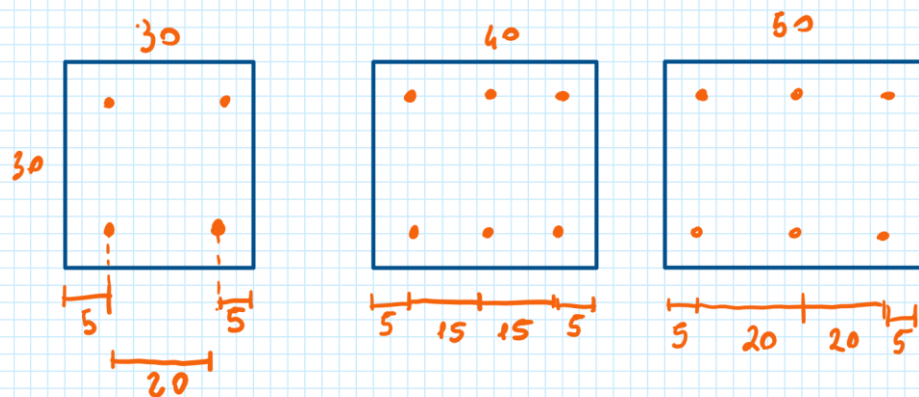


$$S \leq 12 \times 14 = 168^{19} \text{ mm}$$

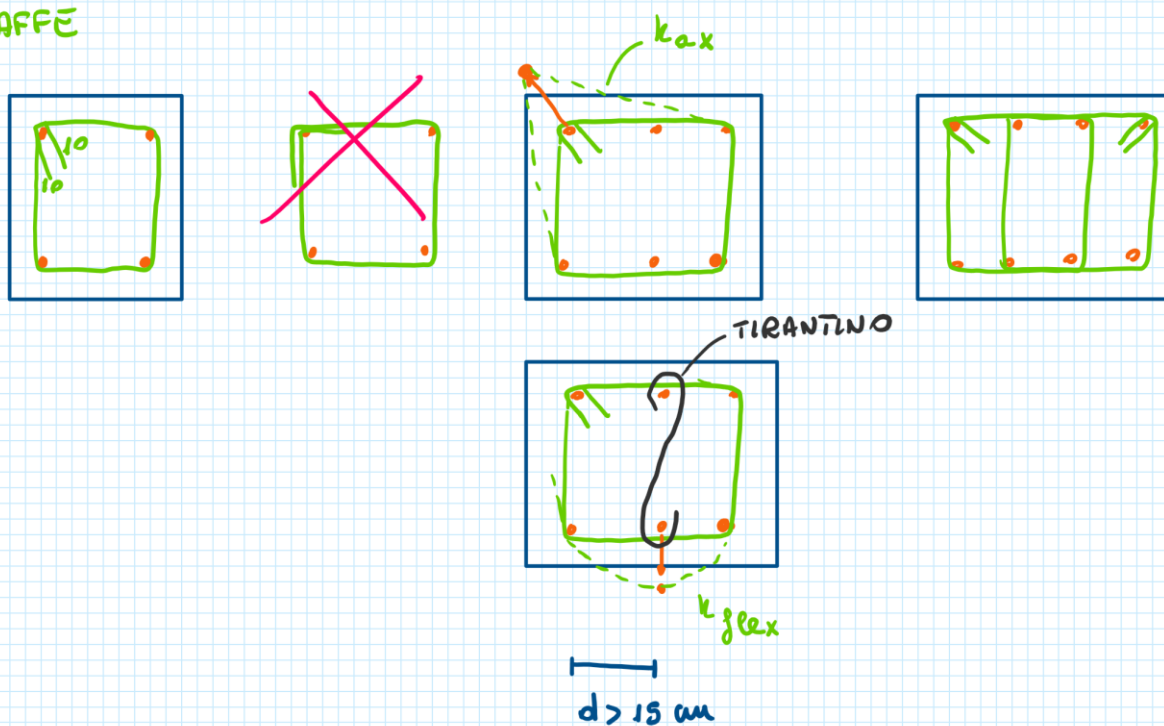
$$0.6 \times S = 0.6 \times 168 = 100.8^{10} \text{ mm}$$



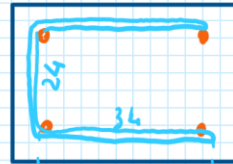
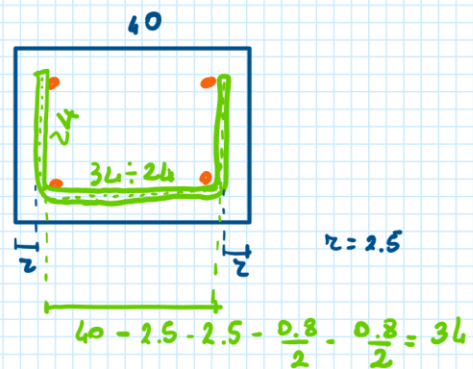
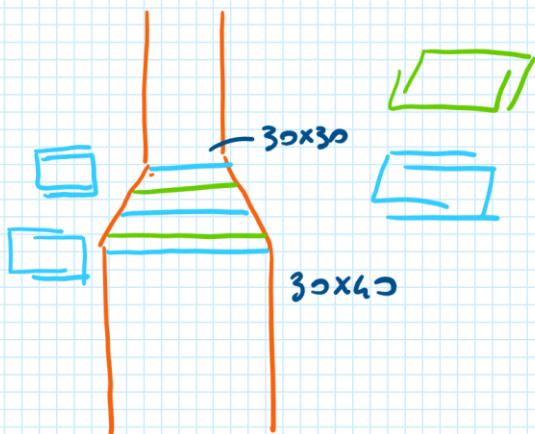
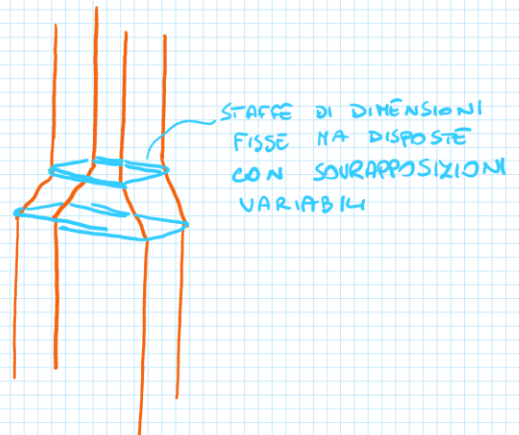
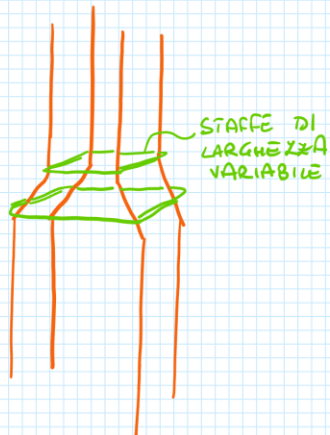
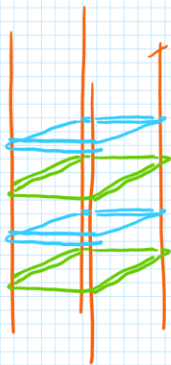
f_{cd}	14.17	MPa	ϕ 14	1.54	cm2								
f_{yd}	391.3	MPa	ϕ 20	3.14	cm2								
Pilastro 1													
P	97.3	kN											
Pia	Pd (kN)	Ned (kN)	Ac,nec (cm2)	b (cm)	h (cm)	Ac (cm2)	As,calc (cm2)	As,min (cm2)	As (cm2)	ϕ 14	ϕ 20	As disposta (cm2)	
6	97.3	97.3	82.4	30	30	900	0.60	5.40	5.40	4	0	6.16	
5	97.3	194.6	164.8	30	30	900	1.19	5.40	5.40	4		6.16	
4	97.3	291.9	247.2	30	30	900	1.79	5.40	5.40	4		6.16	
3	97.3	389.2	329.6	30	30	900	2.39	5.40	5.40	4		6.16	
2	97.3	486.5	412.0	30	30	900	2.98	5.40	5.40	4		6.16	
1	97.3	583.8	494.4	30	30	900	3.58	5.40	5.40	4		6.16	
Pilastro 16													
P	248.3	kN											
Pia	Pd (kN)	Ned (kN)	Ac,nec (cm2)	b (cm)	h (cm)	Ac (cm2)	As,calc (cm2)	As,min (cm2)	As (cm2)	ϕ 14	ϕ 20	As disposta (cm2)	
6	248.3	248.3	210.3	30	30	900	1.52	5.40	5.40	4	0	6.16	
5	248.3	496.6	420.6	30	30	900	3.05	5.40	5.40	4	0	6.16	
4	248.3	744.9	630.8	30	30	900	4.57	5.40	5.40	4	0	6.16	
3	248.3	993.2	841.1	30	30	900	6.09	5.40	6.09	4	0	6.16	
2	248.3	1241.5	1051.4	30	40	1200	7.61	7.20	7.61	6	0	9.24	
1	248.3	1489.8	1261.7	30	50	1500	9.14	9.00	9.14	6	0	9.24	



STAFFE

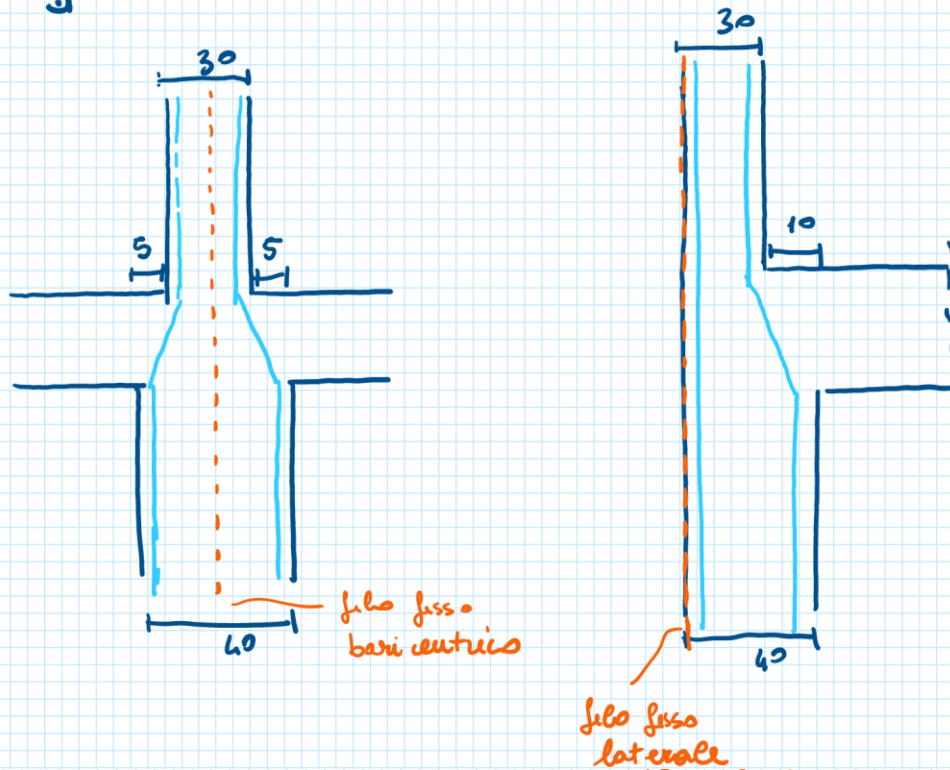


STAFFE NEL NODO



RISEGNA DEI PILASTRI

$$e \leq \frac{1}{5} H_{\text{TRAVE}} \Rightarrow \text{RISEGNA PICCOLA}$$



RISEGNA FORTE

