

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

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

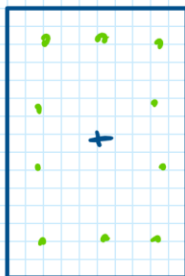
QUINDI POTREI RICAVERE:

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

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

DOBBIAMO TENER CONTO ANCHE DI:

1)



=>



$I^e N_{ed}$

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

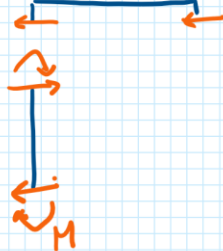
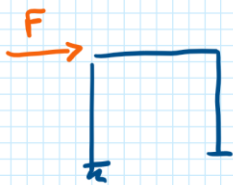
$$(e \geq 0.05 h_{\text{sez}}) \text{ NTC 08}$$

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

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

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

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 = 30×30

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

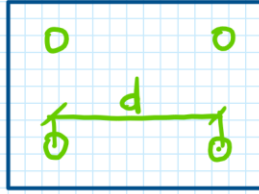
$$A_s \geq 0.6\% A_{c, \text{disp}}$$

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

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

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

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



• STAFFE

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

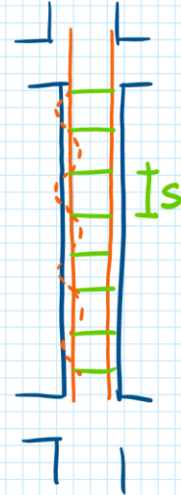
$$\phi_{ST} \geq \frac{1}{4} \phi_L$$

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

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

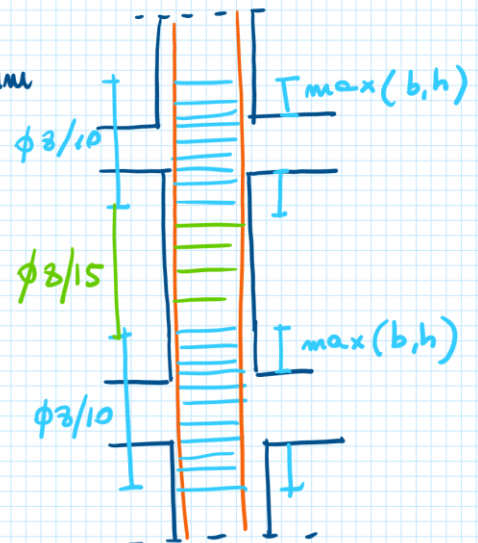
$$S \leq 12 \phi_{L \text{ min}}$$

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

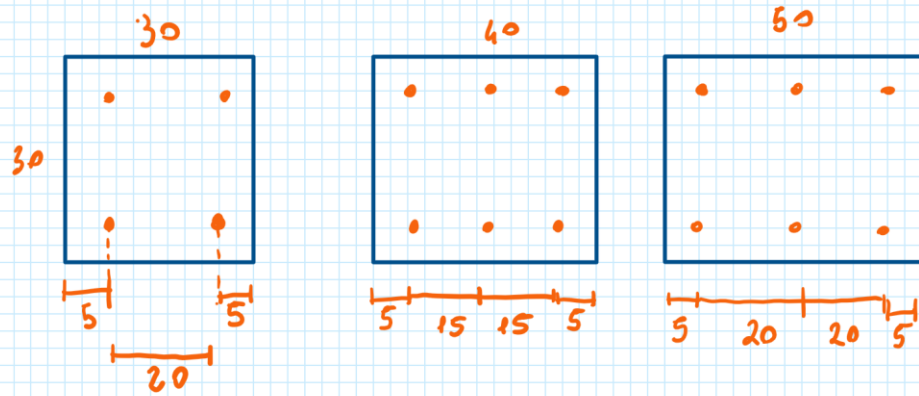


$$S \leq 12 \times 14 = 168^{19} \text{ mm}$$

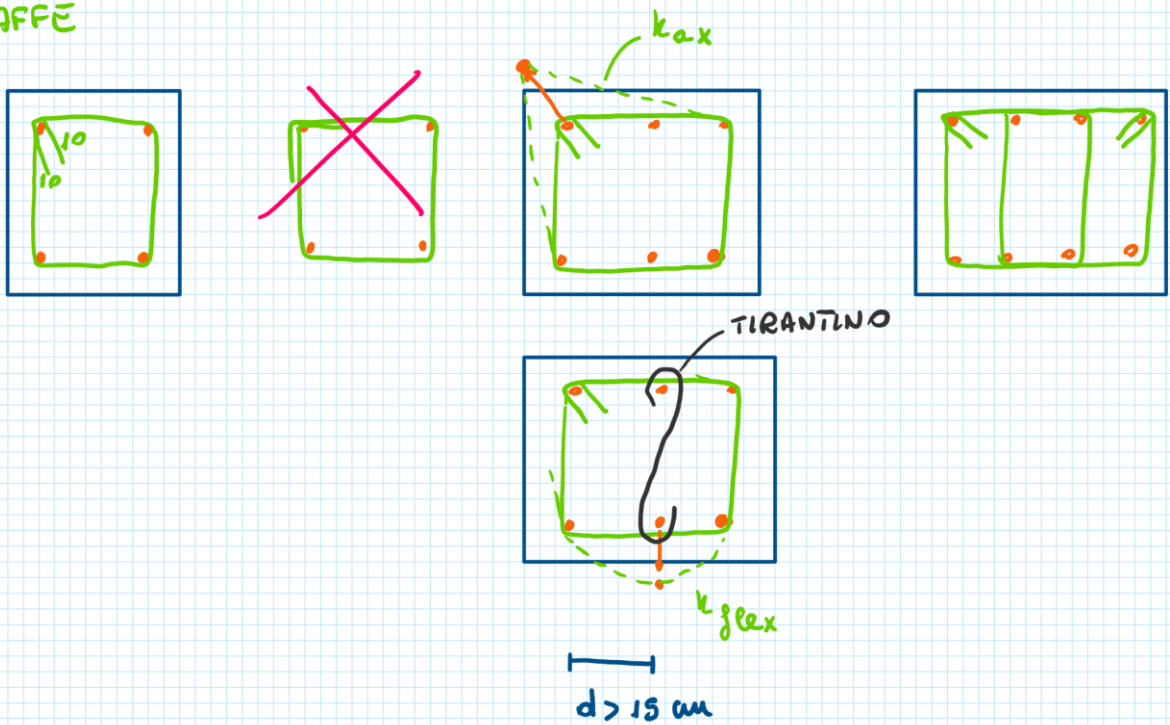
$$0.6 \times S = 0.6 \times 168 = 100.8^{10} \text{ mm}$$



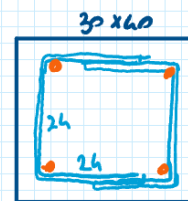
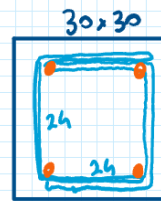
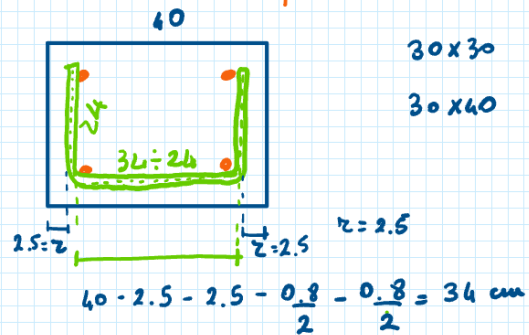
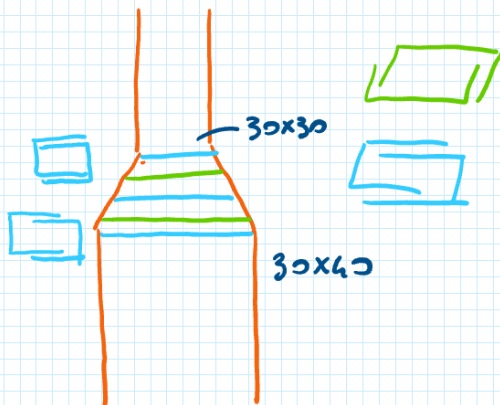
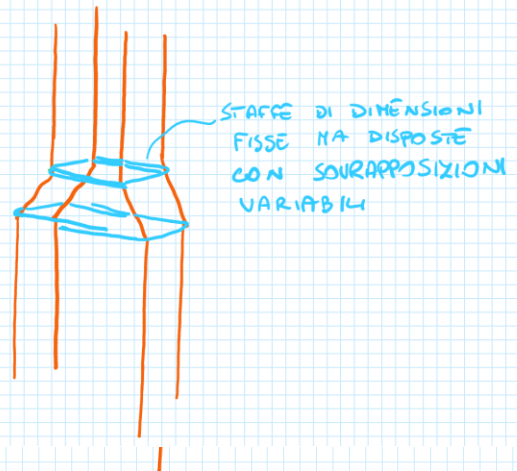
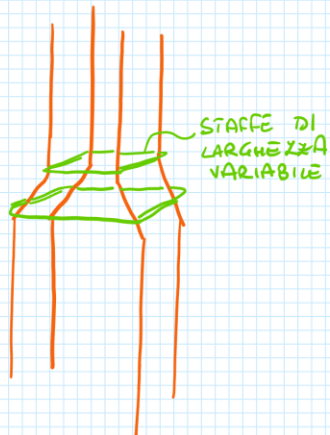
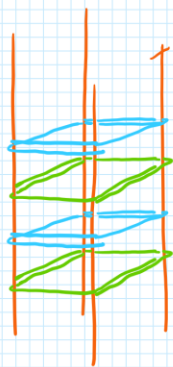
	A	B	C	D	E	F	G	H	I	J	K	L
1	fcd	14.2 Mpa		1φ14	1.54 cm ²							
2	fyd	391.3 MPa		1φ20	3.14 cm ²							
3												
4												
5	P	98 kN										
6	Piano	Ned	Ac [cm ²]	b	h	Ac scelta [cm ²]	As,nec [cm ²]	As,min [cm ²]	As scelta [cm ²]	nφ14	nφ20	As disposta [cm ²]
7	6	98	82.8	30	30	900	0.601	5.4	5.4	4	4	6.16
8	5	196	165.6	30	30	900	1.202	5.4	5.4	4	4	6.16
9	4	294	248.5	30	30	900	1.803	5.4	5.4	4	4	6.16
10	3	392	331.3	30	30	900	2.404	5.4	5.4	4	4	6.16
11	2	490	414.1	30	30	900	3.005	5.4	5.4	4	4	6.16
12	1	588	496.9	30	30	900	3.606	5.4	5.4	4	4	6.16
13												
14												
15												
16												
17	P	270.98 kN										
18	Piano	Ned	Ac [cm ²]	b	h	Ac scelta [cm ²]	As,nec [cm ²]	As,min [cm ²]	As scelta [cm ²]	nφ14	nφ20	As disposta [cm ²]
19	6	270.98	229.0	30	30	900	1.662	5.4	5.4	4	4	6.16
20	5	541.96	458.0	30	30	900	3.324	5.4	5.4	4	4	6.16
21	4	812.94	687.0	30	30	900	4.986	5.4	5.4	4	4	6.16
22	3	1083.92	916.0	30	40	1200	6.648	7.2	7.2	6	6	9.24
23	2	1354.9	1145.0	30	40	1200	8.310	7.2	8.3	6	6	9.24
24	1	1625.88	1374.0	30	50	1500	9.972	9	10.0	8	8	12.32



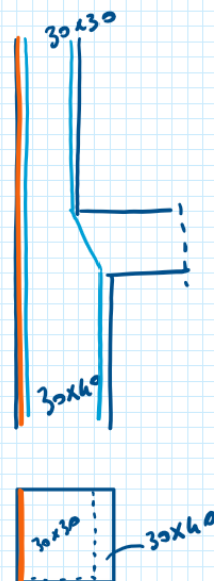
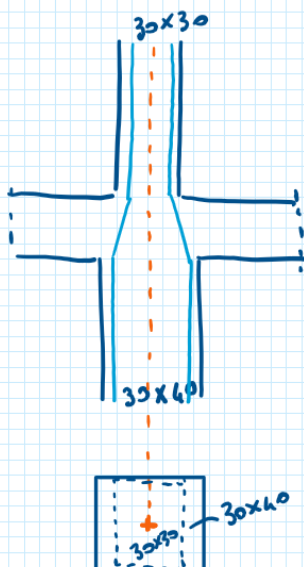
STAFFE



STAFFE NEL NODO

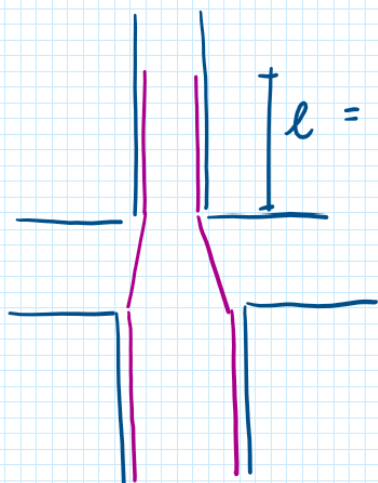
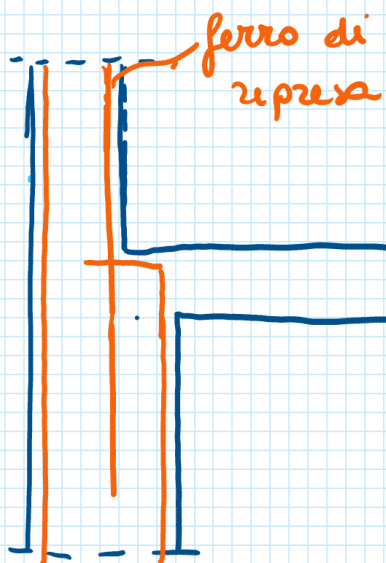


RISEGA NEI PILASTRI



se $RISEGA \leq \frac{1}{5} H_{trave}$
 \Downarrow
 RISEGA PICCOLA

RISERGA FORTE



$$l = 40 \phi \times 1.5 = 40 \times 14 \times 1.5 = 840 \text{ mm}$$

80 cm