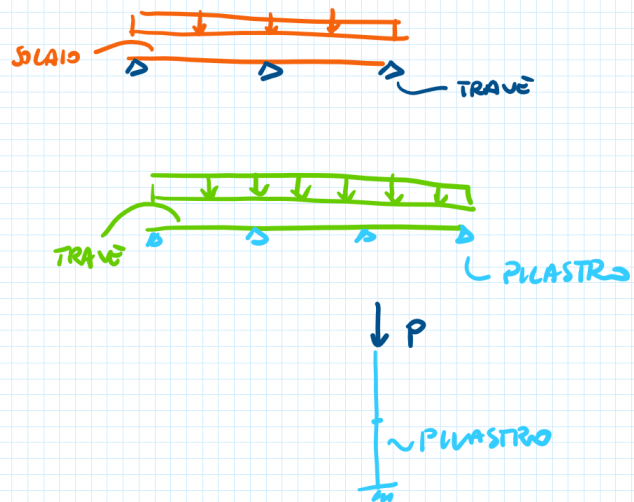
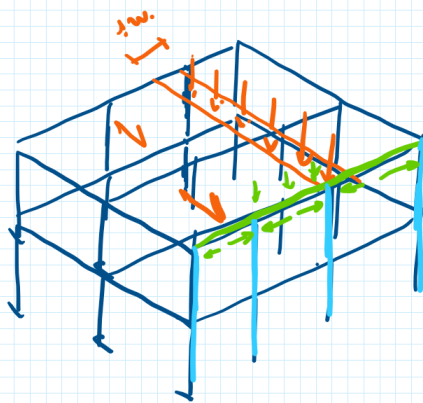


Progetto: scarico di piano sul pilastro

martedì 2 aprile 2024 13:00

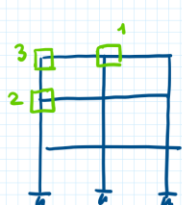


PER PROG. IL PILASTRO DEVO CONOSCERE:

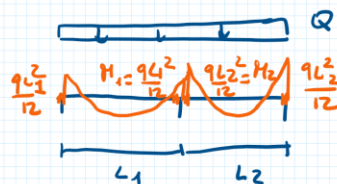
1) $P = ?$

2) N OPPURE $N + M$?

2) N OPPURE $N + M$?



[1]

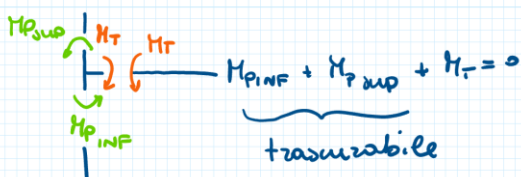
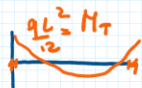


se $L_1 \neq L_2 \Rightarrow M_1 \neq M_2 \Rightarrow$

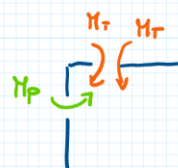
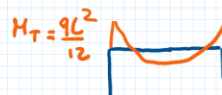
$M_1 + M_2 = \Delta M$ nel pilastro

\Rightarrow sarà piccolo
quindi trascurabile

[2]



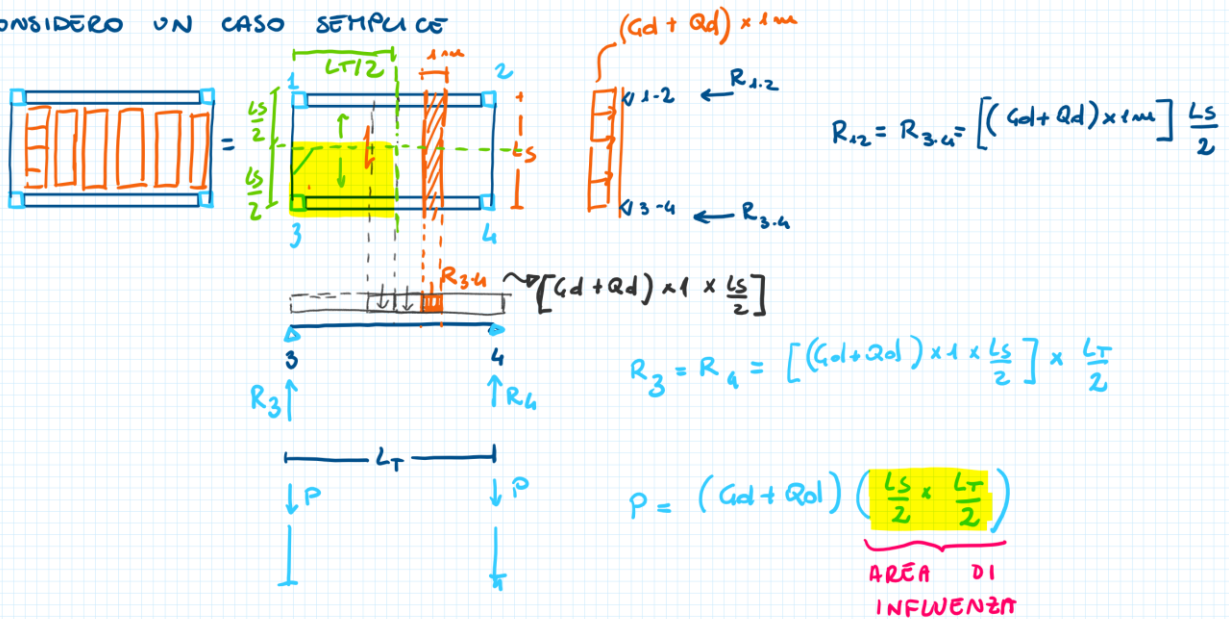
[3]



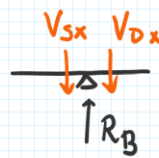
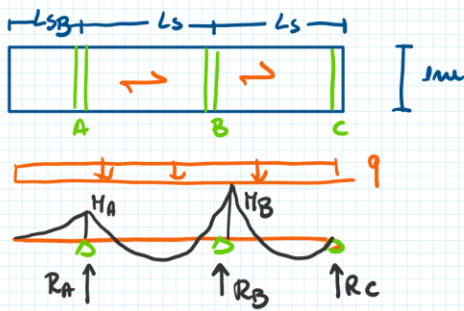
AGGIUGNUTI PIANI IL
PILASTRO << TRAVE
 \Rightarrow
 M_p SARÀ
PICCOLO

1) COME DETERMINO P ?

CONSIDERO UN CASO SEMPLICE



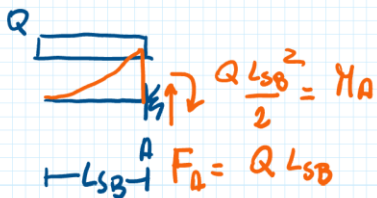
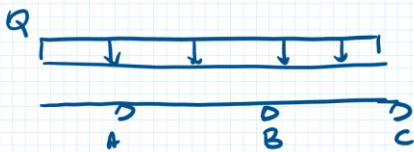
NEI NOSTRI EDIFICI → SCHEMI DI TRAVE CONTINUA



$$V_{sx} = \frac{qL}{2} ?$$

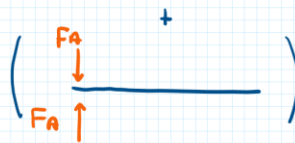
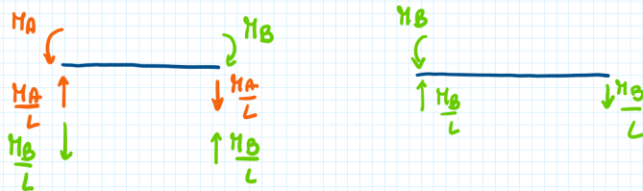
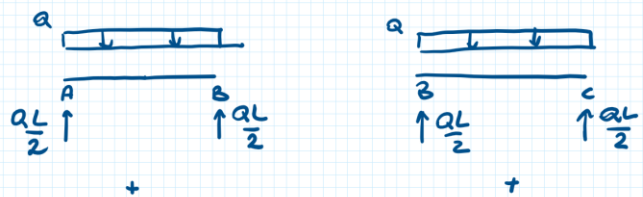
$$V_{dx} = \frac{qL}{2} ?$$

NON È COSÌ IMMEDIATO!



Q

 $\frac{Q L_{SB}^2}{2} = M_A$
 $F_A = Q L_{SB}$



$V_A = \frac{Q_L}{2} + \frac{M_A}{L} - \frac{M_B}{L} + (F_A)$

$V_B = \frac{Q_L}{2} + \frac{M_B}{L} - \frac{M_A}{L}$

se $M_A \approx M_B \Rightarrow V_A \approx V_B \approx \frac{Q_L}{2}$

$V = \frac{Q_L}{2} \times \alpha$
 $\alpha \approx 1.0$

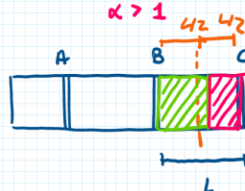
$V_B = \frac{Q_L}{2} + \frac{M_B}{L}$
 $V_C = \frac{Q_L}{2} - \frac{M_B}{L}$

$V_B = \frac{Q_L}{2} \left(1 + \frac{M_B}{L} \frac{2}{Q_L} \right)$

$V_C = \frac{Q_L}{2} \left(1 - \frac{M_B}{L} \frac{2}{Q_L} \right)$

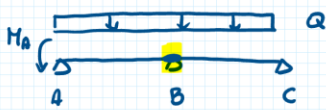
$\alpha > 1$

$\alpha < 1$

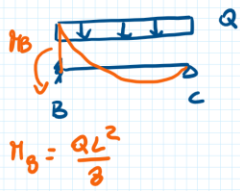


$\alpha = \text{COEFF. DI CONTINUITA'}$

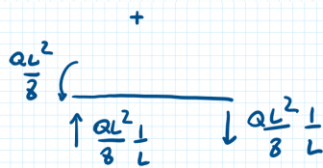
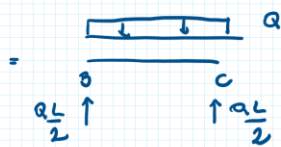
PER DETERMINARE I COEFF. DI CONTINUITA' CONSIDERO DEGLI SCHEMI LIMITI



1) TRATTO BC

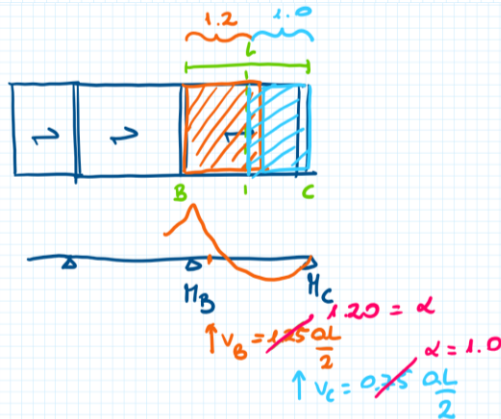


$$H_B = \frac{QL^2}{8}$$

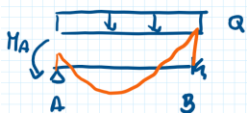


$$V_B = \frac{QL}{2} + \frac{QL^2}{8L} = \frac{QL}{2} \left(1 + \frac{1}{4}\right) = 1.25 \frac{QL}{2}$$

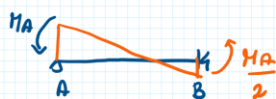
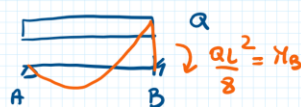
$$V_C = \frac{QL}{2} - \frac{QL^2}{8L} = \frac{QL}{2} \left(1 - \frac{1}{4}\right) = 0.75 \frac{QL}{2}$$



2) TRATTO AB



$$H_A = \frac{H_B}{2}$$



$$\begin{cases} H_B = \frac{QL^2}{8} - \frac{H_A}{2} \\ H_A = \frac{H_B}{2} \end{cases} \Rightarrow H_B = \frac{QL^2}{8} - \frac{1}{2} \frac{H_B}{2}$$

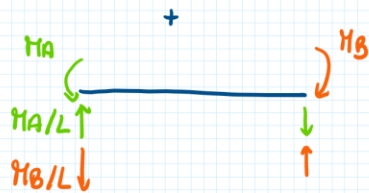
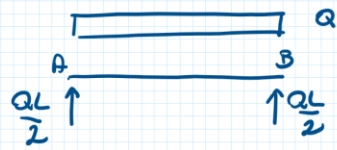
$$H_B \left(1 + \frac{1}{4}\right) = \frac{QL^2}{8}$$

$$H_B \frac{5}{4} = \frac{QL^2}{8}$$

$$H_B = \frac{QL^2}{10}$$

$$\hookrightarrow H_A = \frac{QL^2}{20}$$

CALCOLO I TAGLI :



$$V_A = \frac{QL}{2} + \frac{QL^2}{20L} - \frac{QL^2}{10L}$$

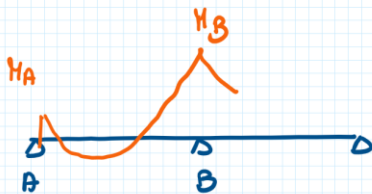
$$V_A = \frac{QL}{2} \left(1 + \frac{1}{10} - \frac{1}{5} \right) \quad \frac{1}{10} - \frac{1}{5} = \frac{1-2}{10} = -\frac{1}{10}$$

$\alpha = 0.9$

$$V_B = \frac{QL}{2} + \frac{QL^2}{10L} - \frac{QL^2}{20L}$$

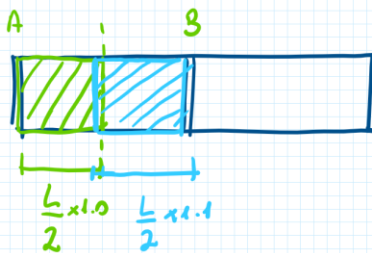
$$V_B = \frac{QL}{2} \left[1 + \frac{1}{5} - \frac{1}{10} \right] \quad \frac{1}{5} - \frac{1}{10} = \frac{2-1}{10} = \frac{1}{10}$$

$\alpha = 1.1$

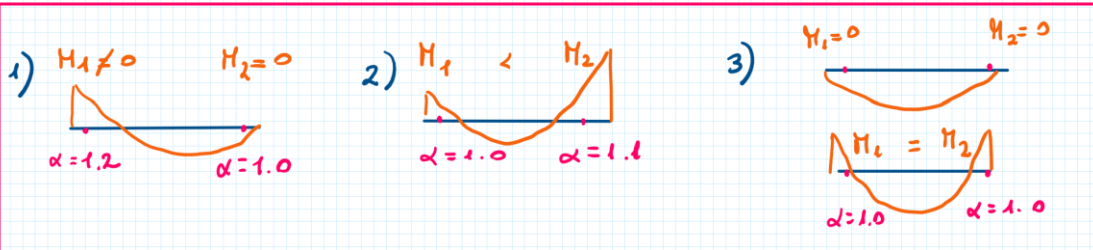


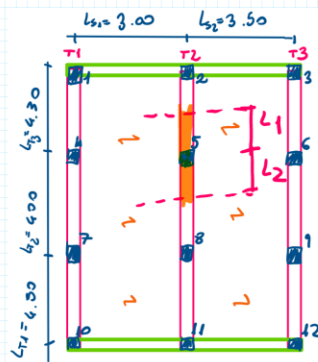
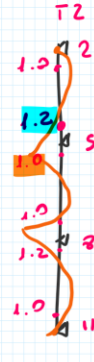
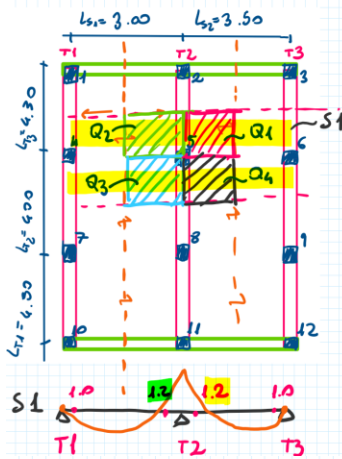
$$\uparrow V_A = \frac{QL}{2} \times 1.0$$

$$\uparrow V_B = \frac{QL}{2} \times 1.1$$



QUINDI :





ESEMPIO: PLASTRO S

$$P_5 = \overbrace{P_{sol} + P_{tra}}^{P_{TOT}} + P.P.$$

$$P_{sol} = (Q_1 + Q_2 + Q_3 + Q_4) (G_d + Q_d)_{sol}$$

$$P_{tra} = (L_1 + L_2) G_{dtra}$$

$$P_{TOT} = P_{sol} + P_{tra}$$

$$PESO PROPRIO = \frac{N_{PIANO}}{100} P_{TOT}$$

$$Q_1 = \left(\frac{L_{S2}}{2} \times 1.2 \right) \times \left(\frac{L_{T3}}{2} \times 1.2 \right) = \left(\frac{3.50}{2} \times 1.2 \right) \times \left(\frac{4.30}{2} \times 1.2 \right) = 5.42 \text{ m}^2$$

$$Q_2 = \left(\frac{L_{S1}}{2} \times 1.2 \right) \times \left(\frac{L_{T3}}{2} \times 1.2 \right) = \left(\frac{3.0}{2} \times 1.2 \right) \times \left(\frac{4.30}{2} \times 1.2 \right) = 4.64 \text{ m}^2$$

$$Q_3 = \left(\frac{L_{S1}}{2} \times 1.2 \right) \times \left(\frac{L_{T2}}{2} \times 1.0 \right) = \left(\frac{3.0}{2} \times 1.2 \right) \times \left(\frac{4.0}{2} \times 1.0 \right) = 3.6 \text{ m}^2$$

$$Q_4 = \left(\frac{L_{S2}}{2} \times 1.2 \right) \times \left(\frac{L_{T2}}{2} \times 1.0 \right) = \left(\frac{3.50}{2} \times 1.2 \right) \times \left(\frac{4.0}{2} \times 1.0 \right) = 4.2 \text{ m}^2$$

$$(G_d + Q_d)_{sol} = 8.43 + 3.0 = 11.43 \text{ kN/m}^2$$

$$17.86 \text{ m}^2$$

$$P_{sol} = 17.86 \times 11.43 = 204.14 \text{ kN}$$

$$L_1 = \frac{L_{T3}}{2} \times 1.2 = \frac{4.30}{2} \times 1.2 = 2.58 \text{ m}$$

$$L_2 = \frac{L_{T2}}{2} \times 1.0 = \frac{4.00}{2} \times 1.0 = 2.0 \text{ m}$$

$$L = 4.58 \text{ m}$$

$$P_{tra} = 4.58 \times 3.74 = 17.13 \text{ kN}$$

$$P_{TOT} = 204.14 + 17.13 = 221.27 \text{ kN}$$

$$P.P = \frac{6}{100} \times 221.27 = 13.28 \text{ kN}$$

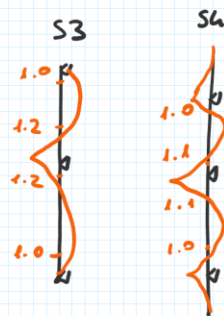
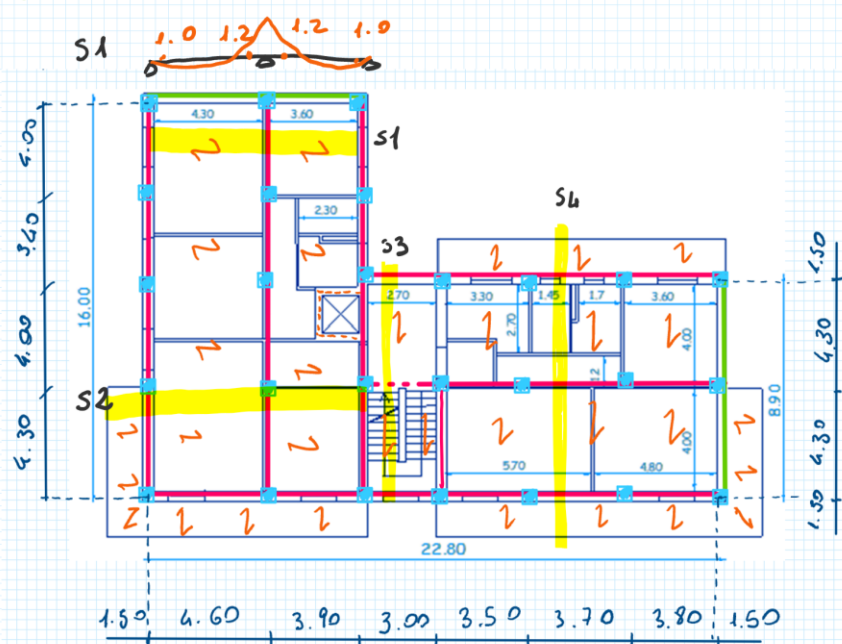
$$P_5 = 221.27 + 13.28 = 234.55 \text{ kN}$$



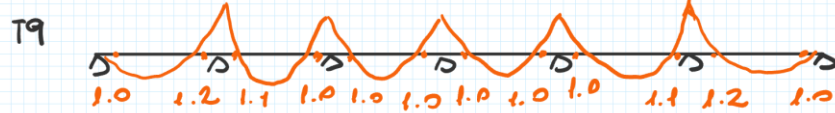
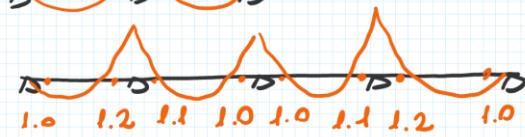
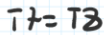
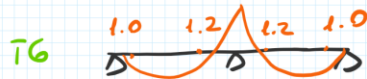
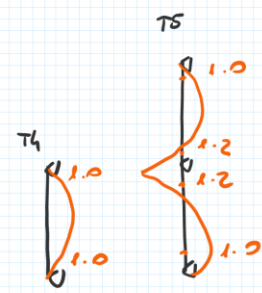
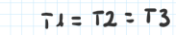
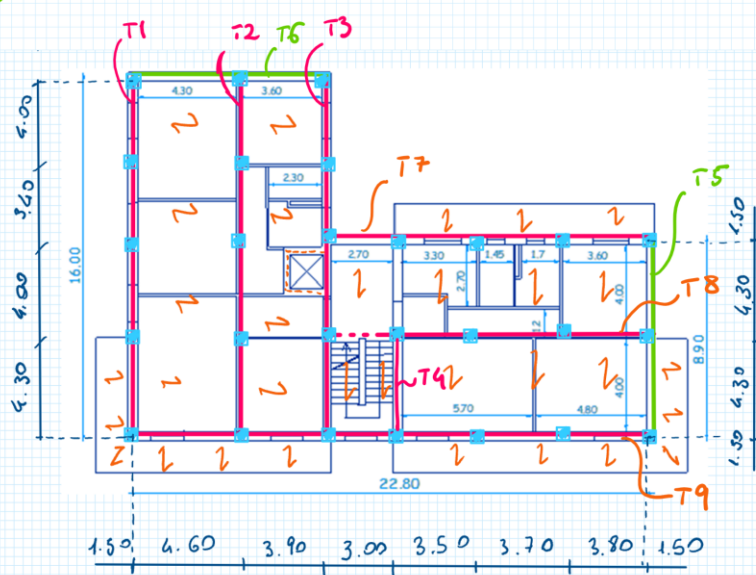
PER IL PROGETTO:

- 1) SCHEMI STATICI DEI SOLAI (S)
- 2) SCHEMI STATICI DELLE TRAVI (T)
- 3) P DEI PILASTRI

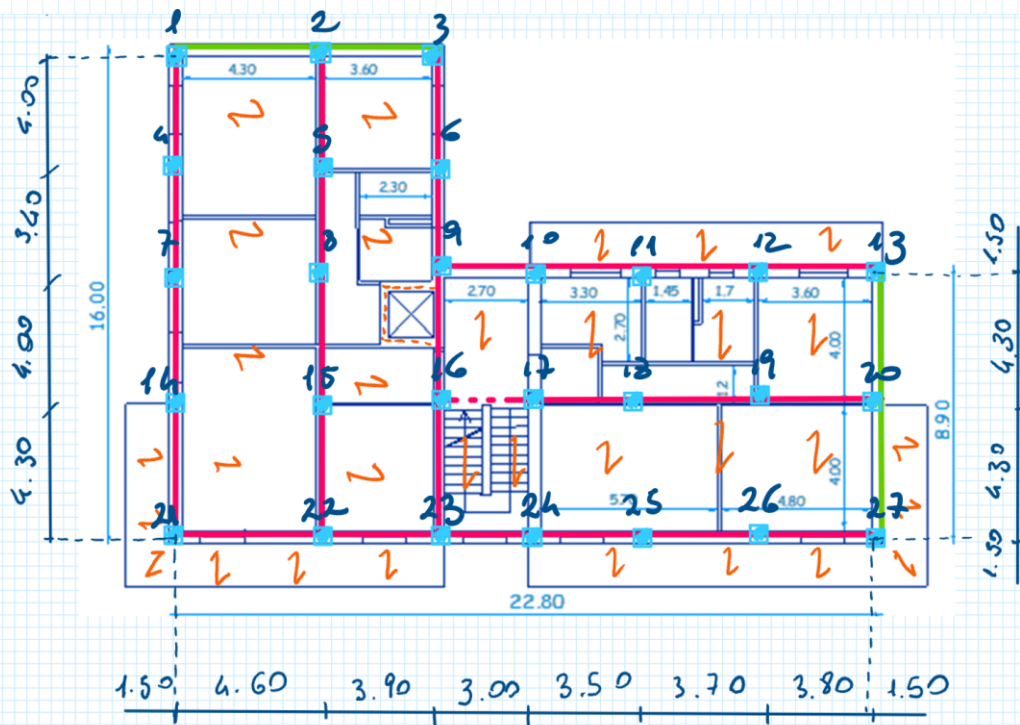
1) SCHEMI DI SOLAIO



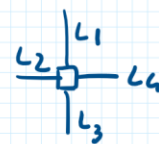
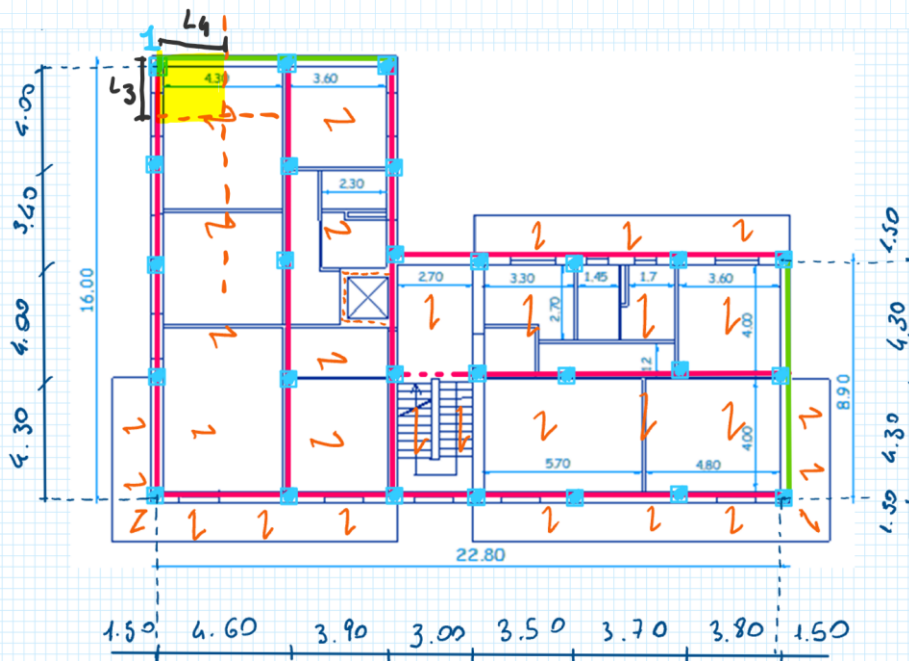
2) SCHEMI DI TRAVE



3) CARICO P DEI PILASTRI



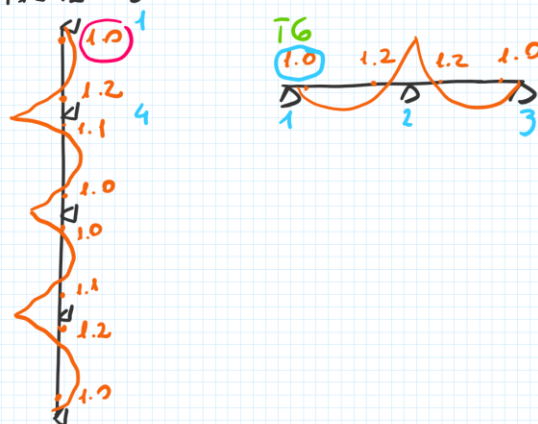
PILASTRO 1



S_1

$$\tau_1 = \tau_2 = \tau_3$$

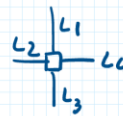
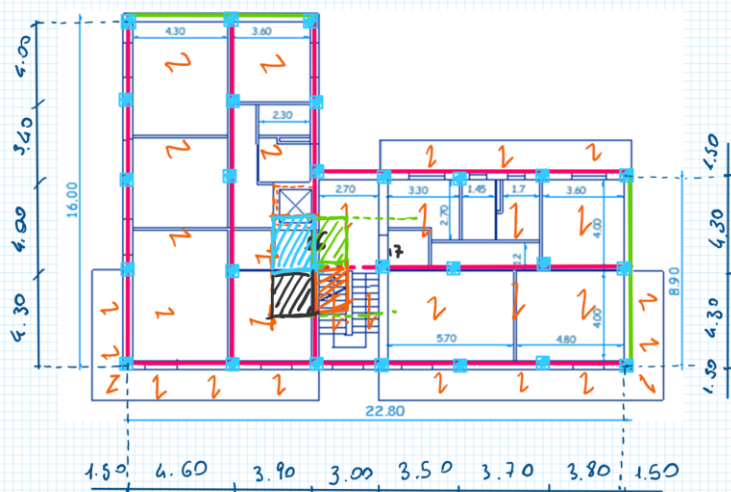
$$L_4 = \frac{4.60}{2} \times 1.0$$



PILASTRO 1

	C.U. [kN/m ²]	Q1	Q2	Q3	Q4	A infl [m ²]	P [kN]
Solaio	11.43					4.6	52.6
Scala	14.97						0
Balcone	12.02						0
	C.U. [kN/m]	L1	L2	L3	L4	L infl [m]	P[kN]
Trave em.	3.74				2	2.3	16.1
Trave sp.	2.22					0	0
Tamp.	5.37				2	2.3	23.1
						Ptot	91.8 kN
						P.P.	5.5 kN
						P	97.3 kN

PI4FSTR0 16



$$Q_1 = \left(\frac{4.30}{2} \times 1.2 \right) \left(\frac{3.0}{2} \times 1.0 \right)$$

$$Q_2 = \left(\frac{3.9}{2} \times 1.0 \right) \times \left(\frac{4.3}{2} \times 1.1 \right)$$

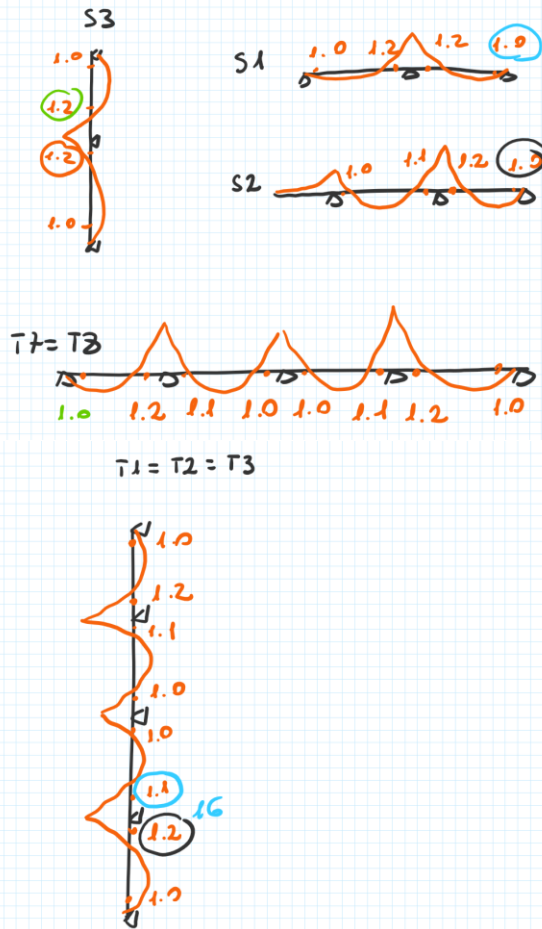
$$Q_3 = \left(\frac{3.9}{2} \times 1.0 \right) \times \left(\frac{4.3}{2} \times 1.2 \right)$$

$$Q_4 = \left(\frac{4.30}{2} \times 1.2 \right) \times \left(\frac{3.0}{2} \times 1.0 \right)$$

$$L_1 = \frac{4.30}{2} \times 1.1$$

$$L_3 = \frac{4.30}{2} \times 1.2$$

$$L_4 = \frac{3.0}{2} \times 1.0$$



PILASTRO 16							
	C.U. [kN/m ²]	Q1	Q2	Q3	Q4	A infl [m ²]	P [kN]
Solaio	11.43	3.87	4.61175	5.031		13.51	154.5
Scala	14.97				3.87	3.87	57.93
Balcone	12.02					0	0
	C.U. [kN/m]	L1	L2	L3	L4	L infl [m]	P[kN]
Trave em.	3.74	2.365			2.58	4.95	18.5
Trave sp.	2.22				1.5	1.5	3.33
Tamp.	5.37					0	0.0
						Ptot	234.2 kN
						P.P.	14.1 kN
						P	248.3 kN