



LAVORI
CASA POPOLARE
BARI

Calcolo statico



Costruzione di n° 20 alloggi in Francavilla Fontana, Contrada Cretarossa, Gruppo C/9.

- CALCOLI STATICI -

- ANALISI DEI CARICHI -

- SOLAIO COPERTURA (MONOTRAVE 9x12 l = 50 cm TIPO 6LA)

PESO PROPRIO SOLAIO $h = (20+5) \text{ cm}$	325,00	Kg/MQ.
CARICHI PERMANENTI	150,00	"
CARICHI ACCIDENTALI	150,00	"
	<u>625,00</u>	Kg/MQ.

- BALCONI

PESO PROPRIO	325,00	Kg/MQ.
CARICHI PERMANENTI	50,00	"
CARICHI ACCIDENTALI	400,00	"
	<u>775,00</u>	Kg/MQ.

- SCALA

PESO PROPRIO	500,00	Kg/MQ.
CARICHI PERMANENTI	150,00	"
CARICHI ACCIDENTALI	400,00	"
	<u>1050,00</u>	Kg/MQ.

- SOLAIO TIPO

PESO PROPRIO $h = (20+5) \text{ cm}$	325,00	Kg/MQ.
CARICHI PERMANENTI	200,00	"
CARICHI ACCIDENTALI	200,00	"
	<u>725,00</u>	Kg/MQ.

- HODRATURA

1000,00 Kg/ML

- PARAPETTO

375,00

CARATTERISTICHE DEI MATERIALI:

- ACCIAIO : Fe B 44 K $\rightarrow \sigma_f = 2400 \div 2600$

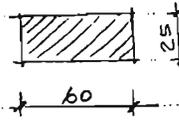
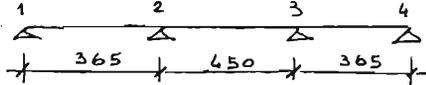
- CALCESTRUZZO : CLASSE 250

$\bar{\sigma}_b = 85 \text{ Kg/cm}^2$; $\bar{\sigma}_{b0} = 5,33 \text{ Kg/cm}^2$; $\bar{\sigma}_{b1} = 16,90 \text{ Kg/cm}^2$
 $\sigma_c = 59,5$ PER $s \leq 25 \text{ cm}$ $\sigma_c = 50,57 \text{ Kg/cm}^2$



SOLAIO A QUOTA + 15,05 (LASTRUCI SOLARI)

TRAVE 1-2.3.4



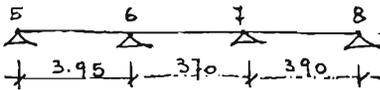
TRATTO (1.2.3)

PESO PROPRIO $0,60 \times 0,25 \times 1,00 \times 2500 = 375,00 \text{ Kg/ml}$
 SOLAIO $625 \times \overline{4,35}/2 = 1360,00 \text{ ''}$
 PARAPETTO $= 375,00 \text{ ''}$
 $2110,00 \text{ Kg/ml}$

TRATTO (3.4)

$= 375,00 \text{ Kg/ml}$
 $1360 + 625 \times 1,50 = 2300,00 \text{ ''}$
 $= 375,00 \text{ ''}$
 $3050,00$

TRAVE 5.6.7.8



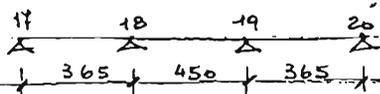
TRATTO (5.6)

PESO PROPRIO $= 375,00 \text{ Kg/ml}$
 SOLAIO $625 \times (\overline{1,50 + 4,75}/2) = 2420,00 \text{ ''}$
 PARAPETTO $= 375,00 \text{ ''}$
 $3170,00 \text{ Kg/ml}$

TRATTO (6.7.8)

$= 375,00 \text{ Kg/ml}$
 $625 \times \overline{4,75}/2 = 1490,00 \text{ ''}$
 $= 375,00 \text{ ''}$
 $2240,00 \text{ Kg/ml}$

TRAVE 17.18.19.20



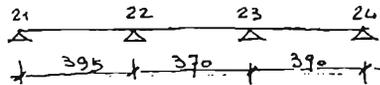
TRATTO (17.18.19)

PESO PROPRIO $= 375,00 \text{ Kg/ml}$
 SOLAIO $625 \times \overline{5,75}/2 = 1640,00 \text{ ''}$
 PARAPETTO $= 375,00 \text{ ''}$
 $2360,00 \text{ Kg/ml}$

TRATTO (19.20)

$= 375,00 \text{ Kg/ml}$
 $1610 + 625 \times 1,50 = 2550,00 \text{ ''}$
 $= 375,00 \text{ ''}$
 $3300,00 \text{ Kg/ml}$

TRAVE 21.22.23.24



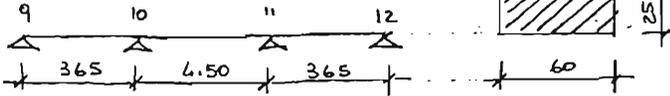
TRATTO (21.22)

PESO PROPRIO $= 375,00 \text{ Kg/ml}$
 SOLAIO $625 \times (\overline{1,50 + 4,75}/2) = 2420,00 \text{ ''}$
 PARAPETTO $= 375,00 \text{ ''}$
 $3170,00 \text{ Kg/ml}$

TRATTO (22.23.24)

$= 375,00 \text{ Kg/ml}$
 $625 \times \overline{4,75}/2 = 1490,00 \text{ ''}$
 $= 375,00 \text{ ''}$
 $2240,00 \text{ Kg/ml}$

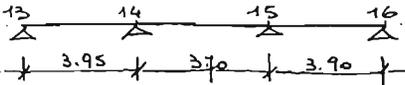
TRAVE 9, 10, 11, 12



PESO PROPRIO = 375,00 Kc/ml
 SOLAIO $625 \times 9,70 / 2 = 3030,00$ "
 3405,00 Kc/ml.

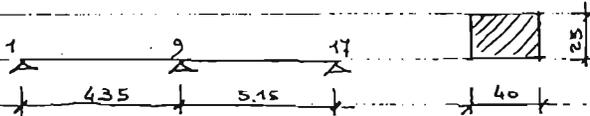


TRAVE 13, 14, 15, 16



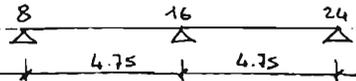
PESO PROPRIO = 375,00 Kc/ml
 SOLAIO = 3030,00 "
 3405,00 Kc/ml.

TRAVE 1, 9, 17



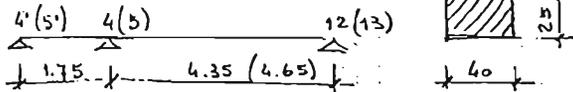
PESO PROPRIO $0,40 \times 0,25 \times 1,00 \times 25,00 = 250,00$ Kc/ml.
 PARAPETTO = 375,00 "
 625,00 Kc/ml.

TRAVE 8, 16, 24



PESO PROPRIO = 250,00 Kc/ml.
 PARAPETTO = 375,00 "
 625,00 Kc/ml.

TRAVI 4', 4, 12 - 5', 5, 13



PESO PROPRIO = 250,00 Kc/ml
 MURATURA = 1000,00 "
 1250,00 Kc/ml

$$R_{1/2} = R_{2/1} = 2110 \times \frac{3,65}{2} = 3850 \text{ K€} \quad R_{22/23} = R_{23/22} = 2240 \times \frac{3,70}{2} = 4150 \text{ K€}$$

$$R_{2/3} = R_{3/2} = 2110 \times \frac{4,50}{2} = 4750 \text{ " } \quad R_{23/24} = R_{24/23} = 2240 \times \frac{3,90}{2} = 4370 \text{ "}$$

$$R_{3/4} = R_{4/3} = 3050 \times \frac{3,65}{2} = 5570 \text{ " } \quad R_{1/9} = R_{9/1} = 625 \times \frac{4,35}{2} = 1360 \text{ "}$$

$$R_{5/6} = R_{6/5} = 3170 \times \frac{3,95}{2} = 6260 \text{ " } \quad R_{9/17} = R_{17/9} = 625 \times \frac{5,15}{2} = 1610 \text{ "}$$

$$R_{6/7} = R_{7/6} = 2240 \times \frac{3,70}{2} = 4150 \text{ " } \quad R_{8/16} = R_{16/8} = 625 \times \frac{4,15}{2} = 1490 \text{ "}$$

$$R_{7/8} = R_{8/7} = 2240 \times \frac{3,90}{2} = 4370 \text{ " } \quad R_{16/24} = R_{24/16} = 625 \times \frac{4,75}{2} = 1490 \text{ "}$$

$$R_{9/10} = R_{10/9} = 3405 \times \frac{3,65}{2} = 6220 \text{ " } \quad R_{4/4'} = R_{4'/4} = 1250 \times \frac{1,75}{2} = 1100 \text{ "}$$

$$R_{10/11} = R_{11/10} = 3405 \times \frac{4,50}{2} = 7660 \text{ " } \quad R_{4/12} = R_{12/4} = 1250 \times \frac{4,35}{2} = 2720 \text{ "}$$

$$R_{11/12} = R_{12/11} = 3405 \times \frac{3,65}{2} = 6220 \text{ " } \quad R_{5/5'} = R_{5'/5} = 1250 \times \frac{1,75}{2} = 1100 \text{ "}$$

$$R_{13/14} = R_{14/13} = 3405 \times \frac{3,95}{2} = 6730 \text{ " } \quad R_{5/13} = R_{13/5} = 1250 \times \frac{4,65}{2} = 2910 \text{ "}$$

$$R_{14/15} = R_{15/14} = 3405 \times \frac{3,70}{2} = 6300 \text{ "}$$

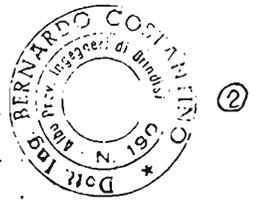
$$R_{15/16} = R_{16/15} = 3405 \times \frac{3,90}{2} = 6640 \text{ "}$$

$$R_{17/18} = R_{18/17} = 2360 \times \frac{3,65}{2} = 4310 \text{ "}$$

$$R_{18/19} = R_{19/18} = 2360 \times \frac{4,50}{2} = 5310 \text{ "}$$

$$R_{19/20} = R_{20/19} = 3300 \times \frac{3,65}{2} = 6020 \text{ "}$$

$$R_{21/22} = R_{22/21} = 3170 \times \frac{3,95}{2} = 6260 \text{ "}$$



CONTINUAZIONE SOLAIO A QUOTA + 15.05 (LASFRECCIA SOLARI)

CALCOLO ORDITURA TRAVI -

TRAVE 1-2-3-4

TRATTO 1-2 $M = 2110 \times \frac{3,65^2}{10} = 2810 \text{ kgm}$; $\sqrt{M/b} = \sqrt{\frac{2810}{0,60}} = 68,43$; $c_h = \frac{22}{68,43} = 0,321$ $\frac{4 \cdot 2600}{A_f \cdot A'_f} \rightarrow \sigma_c = 60 \text{ kg}$
 $A_f = A'_f = 0,00131 \times 68,43 \times 60 = 5,38 \text{ cm}^2$

TRATTO 2-3 $M = 2110 \times \frac{4,15^2}{12} = 3560$ " ; $\sqrt{M/b} = \sqrt{\frac{3560}{0,60}} = 77,03$; $c_h = \frac{22}{77,03} = 0,285$ $\frac{4 \cdot 2600}{A_f \cdot A'_f} \rightarrow \sigma_c = 66$ "
 $A_f = A'_f = 0,00146 \times 77,03 \times 60 = 6,75 \text{ cm}^2$

TRATTO 3-4 $M = 3050 \times \frac{3,65^2}{10} = 4060$ " ; $\sqrt{M/b} = \sqrt{\frac{4060}{0,60}} = 82,26$; $c_h = \frac{22}{82,26} = 0,267$ $\frac{4 \cdot 2600}{A_f \cdot A'_f} \rightarrow \sigma_c = 70$ "
 $A_f = A'_f = 0,00156 \times 82,26 \times 60 = 7,70 \text{ cm}^2$

TRAVE 5-6-7-8

TRATTO 5-6 $M = 3170 \times \frac{3,95^2}{10} = 4950$ " ; $\sqrt{M/b} = \sqrt{\frac{4950}{0,60}} = 90,83$; $c_h = \frac{22}{90,83} = 0,242$ $\frac{4 \cdot 2600}{A_f \cdot A'_f} \rightarrow \sigma_c = 77$ "
 $A_f = A'_f = 0,00174 \times 90,83 \times 60 = 9,48 \text{ cm}^2$

TRATTO 6-7 $M = 2240 \times \frac{3,70^2}{12} = 2560$ " ; $\sqrt{M/b} = \sqrt{\frac{2560}{0,60}} = 65,32$; $c_h = \frac{22}{65,32} = 0,337$ $\frac{4 \cdot 2600}{A_f \cdot A'_f} \rightarrow \sigma_c = 57$ "
 $A_f = A'_f = 0,00122 \times 65,32 \times 60 = 4,78 \text{ cm}^2$

TRATTO 7-8 $M = 2240 \times \frac{3,9^2}{10} = 3410$ " ; $\sqrt{M/b} = \sqrt{\frac{3410}{0,60}} = 75,39$; $c_h = \frac{22}{75,39} = 0,292$ $\frac{4 \cdot 2600}{A_f \cdot A'_f} \rightarrow \sigma_c = 65$ "
 $A_f = A'_f = 0,00143 \times 75,39 \times 60 = 6,47 \text{ cm}^2$

- TRAVE 17-18-19-20

TRATTO 17-18 $M = 2360 \times \frac{3,65^2}{10} = 3150$ " ; $\sqrt{M/b} = \sqrt{\frac{3150}{0,60}} = 72,46$; $c_h = \frac{22}{72,46} = 0,304$ $\frac{4 \cdot 2600}{A_f \cdot A'_f} \rightarrow \sigma_c = 58$ "
 $A_f = A'_f = 0,00137 \times 72,46 \times 60 = 5,96 \text{ cm}^2$

TRATTO 18-19 $M = 2360 \times \frac{4,15^2}{12} = 3980$ " ; $\sqrt{M/b} = \sqrt{\frac{3980}{0,60}} = 81,44$; $c_h = \frac{22}{81,44} = 0,270$ $\frac{4 \cdot 2600}{A_f \cdot A'_f} \rightarrow \sigma_c = 70$ "
 $A_f = A'_f = 0,00156 \times 81,44 \times 60 = 7,63 \text{ cm}^2$

TRATTO 19-20 $M = 3300 \times \frac{3,65^2}{10} = 4400$ " ; $\sqrt{M/b} = \sqrt{\frac{4400}{0,60}} = 85,63$; $c_h = \frac{22}{85,63} = 0,257$ $\frac{4 \cdot 2600}{A_f \cdot A'_f} \rightarrow \sigma_c = 73$ "
 $A_f = A'_f = 0,00163 \times 85,63 \times 60 = 8,38 \text{ cm}^2$

TRAVE 21-22-23-24

$$\text{TRATTO 21-22} \quad M = 3170 \times \frac{3,9^2}{10} = 4950 \text{ KcM} \quad ; \quad \sqrt{\frac{M}{b}} = \sqrt{\frac{4950}{0,60}} = 90,83 \quad ; \quad c_h = \frac{22}{90,83} = 0,242 \quad \frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 77 \text{ Kc/cm}^2$$

$$A_f = A'_f = 0,00174 \times 90,83 \times 60 = 9,48 \text{ cm}^2$$

$$\text{TRATTO 22-23} \quad M = 2240 \times \frac{3,7^2}{12} = 2560 \text{ " } \quad ; \quad \sqrt{\frac{M}{b}} = \sqrt{\frac{2560}{0,60}} = 65,32 \quad ; \quad c_h = \frac{22}{65,32} = 0,336 \quad \frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 58 \text{ "}$$

$$A_f = A'_f = 0,00125 \times 65,32 \times 60 = 4,90 \text{ cm}^2$$

$$\text{TRATTO 23-24} \quad M = 2240 \times \frac{3,9^2}{10} = 3410 \text{ " } \quad ; \quad \sqrt{\frac{M}{b}} = \sqrt{\frac{3410}{0,60}} = 75,39 \quad ; \quad c_h = \frac{22}{75,39} = 0,292 \quad \frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 65 \text{ "}$$

$$A_f = A'_f = 0,00143 \times 75,39 \times 60 = 6,47 \text{ cm}^2$$

TRAVE 9-10-11-12

$$\text{TRATTO 9-10} \quad M = 3405 \times \frac{3,65^2}{10} = 4540 \text{ KcM} \quad ; \quad \sqrt{\frac{M}{b}} = \sqrt{\frac{4540}{0,60}} = 86,99 \quad ; \quad c_h = \frac{22}{86,99} = 0,253 \quad \frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 74 \text{ "}$$

$$A_f = A'_f = 0,00167 \times 86,99 \times 60 = 8,72 \text{ cm}^2$$

$$\text{TRATTO 10-11} \quad M = 3405 \times \frac{4,5^2}{12} = 5750 \text{ " } \quad ; \quad \sqrt{\frac{M}{b}} = \sqrt{\frac{5750}{0,60}} = 97,89 \quad ; \quad c_h = \frac{22}{97,89} = 0,225 \quad \frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 82 \text{ "}$$

$$A_f = A'_f = 0,00188 \times 97,89 \times 60 = 11,04 \text{ cm}^2$$

$$\text{TRATTO 11-12} \quad M = 3405 \times \frac{3,65^2}{10} = 4540 \text{ " } \quad ; \quad \sqrt{\frac{M}{b}} = \sqrt{\frac{4540}{0,60}} = 86,99 \quad ; \quad c_h = \frac{22}{86,99} = 0,253 \quad \frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 74 \text{ "}$$

$$A_f = A'_f = 0,00166 \times 86,99 \times 60 = 8,66 \text{ cm}^2$$

TRAVE 13-14-15-16

$$\text{TRATTO 13-14} \quad M = 3405 \times \frac{3,95^2}{10} = 5310 \text{ KcM} \quad ; \quad \sqrt{\frac{M}{b}} = \sqrt{\frac{5310}{0,60}} = 94,07 \quad ; \quad c_h = \frac{22}{94,07} = 0,234 \quad \frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 79 \text{ "}$$

$$A_f = A'_f = 0,00167 \times 94,07 \times 60 = 9,42 \text{ cm}^2$$

$$\text{TRATTO 14-15} \quad M = 3405 \times \frac{3,7^2}{12} = 3890 \text{ " } \quad ; \quad \sqrt{\frac{M}{b}} = \sqrt{\frac{3890}{0,60}} = 80,52 \quad ; \quad c_h = \frac{22}{80,52} = 0,273 \quad \frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 69 \text{ "}$$

$$A_f = A'_f = 0,00154 \times 80,52 \times 60 = 7,46 \text{ cm}^2$$

$$\text{TRATTO 15-16} \quad M = 3405 \times \frac{3,9^2}{10} = 5180 \text{ " } \quad ; \quad \sqrt{\frac{M}{b}} = \sqrt{\frac{5180}{0,60}} = 92,92 \quad ; \quad c_h = \frac{22}{92,92} = 0,236 \quad \frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 79 \text{ "}$$

$$A_f = A'_f = 0,00179 \times 92,92 \times 60 = 9,98 \text{ cm}^2$$



TRAVE 1-9-17

$$\text{TRATTO 1-9} \quad M = \frac{625 \times 4,35^2}{8} = 1480 \text{ kNm}; \quad \sqrt{H/b} = \sqrt{\frac{1480}{0,40}} = 60,83; \quad c_h = \frac{22}{60,83} = 0,361 \quad \frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c < 55 \text{ kN/cm}^2$$
$$A_f = A'_f = 0,00119 \times 60,83 \times 40 = 2,89 \text{ cm}^2$$

$$\text{TRATTO 9-17} \quad M = \frac{625 \times 5,15^2}{8} = 2070 \text{ kNm}; \quad \sqrt{H/b} = \sqrt{\frac{2070}{0,40}} = 71,94; \quad c_h = \frac{22}{71,94} = 0,306 \quad \frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 63 \text{ kN/cm}^2$$
$$A_f = A'_f = 0,00137 \times 71,94 \times 40 = 3,94 \text{ cm}^2$$

TRAVE 8-16-24

$$\text{TRATTO 8-16} \quad M = \frac{625 \times 4,75^2}{8} = 1760 \text{ kNm}; \quad \sqrt{H/b} = \sqrt{\frac{1760}{0,40}} = 66,33; \quad c_h = \frac{22}{66,33} = 0,331 \quad \frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 58 \text{ kN/cm}^2$$
$$A_f = A'_f = 0,00127 \times 66,33 \times 40 = 3,37 \text{ cm}^2$$

$$\text{TRATTO 16-24} \quad M = \frac{625 \times 4,75^2}{8} = 1760 \text{ kNm}; \quad \sqrt{H/b} = \sqrt{\frac{1760}{0,40}} = 66,33; \quad c_h = \frac{22}{66,33} = 0,331 \quad \frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 58 \text{ kN/cm}^2$$
$$A_f = A'_f = 0,00127 \times 66,33 \times 40 = 3,37 \text{ cm}^2$$

TRAVE 4'-4-12

$$\text{TRATTO 4'-4} \quad M = \frac{1250 \times 1,75^2}{10} = 380 \text{ kNm};$$

$$\text{TRATTO 4-12} \quad M = \frac{1250 \times 4,35^2}{10} = 2370 \text{ kNm}; \quad \sqrt{H/b} = \sqrt{\frac{2370}{0,40}} = 76,97; \quad c_h = \frac{22}{76,97} = 0,285 \quad \frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 67 \text{ kN/cm}^2$$
$$A_f = A'_f = 0,00147 \times 76,97 \times 40 = 4,53 \text{ cm}^2$$

TRAVE 5'-5-13

$$\text{TRATTO 5'-5} \quad M = \frac{1250 \times 1,75^2}{10} = 380 \text{ kNm};$$

$$\text{TRATTO 5-13} \quad M = \frac{1250 \times 4,65^2}{10} = 2700 \text{ kNm}; \quad \sqrt{H/b} = \sqrt{\frac{2700}{0,40}} = 82,16; \quad c_h = \frac{22}{82,16} = 0,267 \quad \frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 70 \text{ kN/cm}^2$$
$$A_f = A'_f = 0,00156 \times 82,16 \times 40 = 5,13 \text{ cm}^2$$

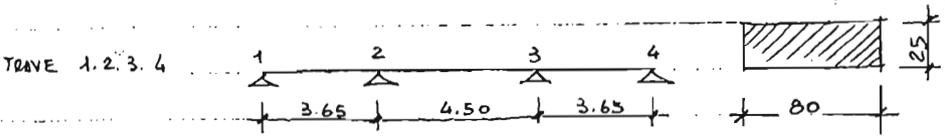
RIEPILOGO PILASTRI Piano 4°

Pilastro

1	R _{1/2} + R _{1/9}	= 3850 + 1360	= 5.210	V ₄
2	R _{2/1} + R _{2/3}	= 3850 + 4750	= 8.600	"
3	R _{3/2} + R _{3/4}	= 4750 + 5570	= 10.320	"
4	R _{4/3} + R _{4/4} + R _{4/12}	= 5570 + 1100 + 2720	= 9.390	"
4'	R _{4/4}	= 1100	= 1.100	"
5	R _{5/5} ' + R _{5/6} + R _{5/13}	= 1100 + 6260 + 2910	= 10.270	"
5'	R _{5/5} '	= 1100	= 1.100	"
6	R _{6/5} + R _{6/7}	= 6260 + 4150	= 10.410	"
7	R _{7/6} + R _{7/8}	= 4150 + 4370	= 8.520	"
8	R _{8/7} + R _{8/16}	= 4370 + 1490	= 5.860	"
9	R _{9/8} + R _{9/10} + R _{9/17}	= 1360 + 6220 + 1610	= 9.190	"
10	R _{10/9} + R _{10/11}	= 6220 + 7660	= 13.880	"
11	R _{11/10} + R _{11/12}	= 7660 + 6220	= 13.880	"
12	R _{12/11} + R _{12/4}	= 6220 + 2720	= 8.940	"
13	R _{13/5} + R _{13/14}	= 2910 + 6730	= 9.640	"
14	R _{14/13} + R _{14/15}	= 6730 + 6300	= 13.030	"
15	R _{15/14} + R _{15/16}	= 6300 + 6640	= 12.940	"
16	R _{16/15} + R _{16/8} + R _{16/24}	= 6640 + 1490 + 1490	= 9.620	"
17	R _{17/9} + R _{17/18}	= 1610 + 4310	= 5.920	"
18	R _{18/17} + R _{18/19}	= 4310 + 5310	= 9.620	"
19	R _{19/18} + R _{19/20}	= 5310 + 6020	= 11.330	"
20	R _{20/19}	= 6020	= 6.020	"
21	R _{21/22}	= 6260	= 6.260	"
22	R _{22/21} + R _{22/23}	= 6260 + 4150	= 10.410	"
23	R _{23/22} + R _{23/24}	= 4150 + 4370	= 8.520	"
24	R _{24/23} + R _{24/16}	= 4370 + 1490	= 5.860	"



SOLAIO Tipo (A QUOTA +12,01; +8,97; +5,93; +2,89)

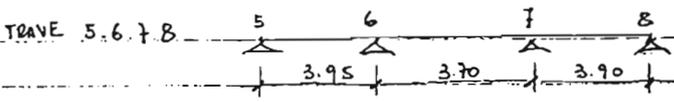


TRATTO (1.2.3)

PESO PROPRIO : $0,80 \times 0,25 \times 1,00 \times 2500 = 500,00 \text{ Kg/m}$
 SOLAIO : $725 \times 4,35 / 2 = 1570,00 \text{ ''}$
 MURATURA : $= 1000,00 \text{ ''}$
3070,00 Kg/m

TRATTO (3.4)

$= 500,00 \text{ Kg/m}$
 $= 1570 + 775 \times 1,50 = 2730,00 \text{ ''}$
 $= 1000,00 \text{ ''}$
4230,00 Kg/m

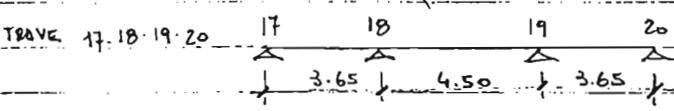


TRATTO (5.6)

PESO PROPRIO : $= 500,00 \text{ Kg/m}$
 SOLAIO : $725 \times 4,75 / 2 = 1720,00 \text{ ''}$
 BALCONE : $775 \times 1,50 = 1160,00 \text{ ''}$
 MURATURA : $= 1000,00 \text{ ''}$
4380,00 Kg/m

TRATTO (6.7.8)

$= 500,00 \text{ Kg/m}$
 $= 1720,00 \text{ ''}$
 $= 1000,00 \text{ ''}$
3220,00 Kg/m

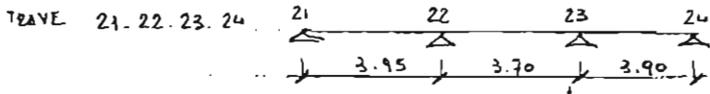


TRATTO (17.18.19)

PESO PROPRIO : $= 500,00 \text{ Kg/m}$
 SOLAIO : $725 \times 5,15 / 2 = 1870,00 \text{ ''}$
 BALCONE : $= 1000,00 \text{ ''}$
3370,00 Kg/m

TRATTO (19.20)

$= 500,00 \text{ Kg/m}$
 $= 1870,00 \text{ ''}$
 $775 \times 1,50 = 1160,00 \text{ ''}$
 $= 1000,00 \text{ ''}$
4530,00 Kg/m



TRATTO (21. 22)

PESO PROPRIO = 500,00 Kg/ml.

SOLAI $725 \times 4,75/2 = 1720,00$ "

BALCOHE $775 \times 1,50 = 1160,00$ "

HORATODA = 1000,00 "

4380,00 Kg/ml.

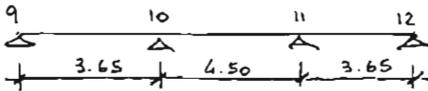
TRATTO (22. 23. 24)

= 500,00 Kg/ml.

= 1720,00 "

= 3220,00 Kg/ml.

TRAVE 9. 10. 11. 12

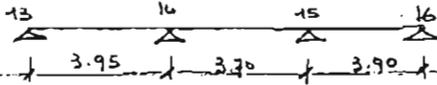


PESO PROPRIO = 500,00 Kg/ml.

SOLAI $725 \times 9,70/2 = 3520,00$ "

4020,00 Kg/ml.

TRAVE 13. 14. 15. 16

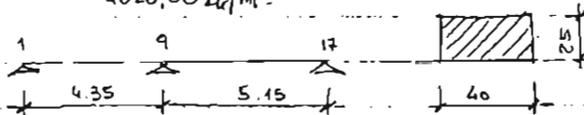


PESO PROPRIO = 500,00 Kg/ml.

SOLAI = 3520,00 "

4020,00 Kg/ml.

TRAVE 1. 9. 17

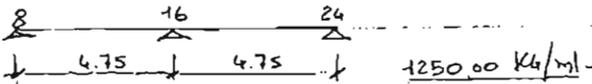


PESO PROPRIO $0,40 \times 0,25 \times 1,00 \times 2500 = 250,00$ Kg/ml.

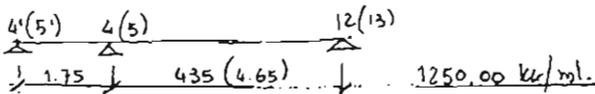
HORATODA = 1000,00 "

1250,00 Kg/ml.

TRAVE 8. 16. 24

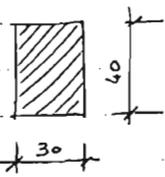
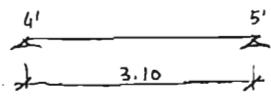


TRAVE 4. 4. 12 - 5. 5. 13



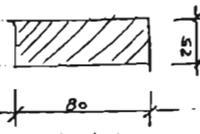
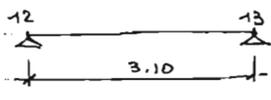


TRAVE. 4'-5'



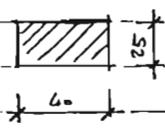
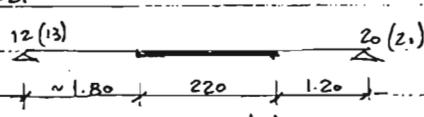
PESO PROPIO = $0,30 \times 0,40 \times 1,00 \times 2500 = 300,00 \text{ Kc/ml}$
MURATURA = $1000,00 \text{ ''}$
SCALA $1050 \times 6,10/2 = 3200,00 \text{ ''}$
 $4500,00 \text{ Kc/ml.}$

TRAVE. 12-13



PESO PROPIO = $0,80 \times 0,25 \times 1,00 \times 2500 = 500,00 \text{ Kc/ml.}$
MURATURA = $3940,00 \text{ ''}$
 $4440,00 \text{ Kc/ml.}$

TRAVE. 12-20 - 13-21



PESO PROPIO = $250,00 \text{ Kc/ml.}$
MURATURA = $1000,00 \text{ ''}$
 $1250,00 \text{ Kc/ml.}$

$$R_{1/2} = R_{21} = 3070 \times \frac{3,65}{2} = 5600 \text{ kg.} \quad R_{22/23} = R_{23/22} = 3220 \times \frac{3,70}{2} = 5960 \text{ kg.}$$

$$R_{2/3} = R_{3/2} = 3070 \times \frac{4,50}{2} = 6910 \text{ " } \quad R_{23/24} = R_{24/23} = 3220 \times \frac{3,90}{2} = 6280 \text{ "}$$

$$R_{3/4} = R_{4/3} = 4230 \times \frac{3,65}{2} = 7720 \text{ " } \quad R_{1/9} = R_{9/1} = 1250 \times \frac{4,35}{2} = 2720 \text{ "}$$

$$R_{5/6} = R_{6/5} = 4380 \times \frac{3,95}{2} = 8650 \text{ " } \quad R_{9/17} = R_{17/9} = 1250 \times \frac{5,15}{2} = 3220 \text{ "}$$

$$R_{6/7} = R_{7/6} = 3220 \times \frac{3,70}{2} = 5960 \text{ " } \quad R_{8/16} = R_{16/8} = 1250 \times \frac{4,75}{2} = 2970 \text{ "}$$

$$R_{16/24} = R_{24/16} = 1250 \times \frac{4,75}{2} = 2970 \text{ "}$$

$$R_{7/8} = R_{8/7} = 3220 \times \frac{3,90}{2} = 6280 \text{ " } \quad R_{4'/5'} = R_{5'/4'} = 4500 \times \frac{3,10}{2} = 6980 \text{ "}$$

$$R_{9/10} = R_{10/9} = 4020 \times \frac{3,65}{2} = 7340 \text{ " } \quad R_{4'/4} = R_{4/4'} = 1250 \times \frac{1,75}{2} = 1090 \text{ "}$$

$$R_{10/11} = R_{11/10} = 4020 \times \frac{4,50}{2} = 9050 \text{ " } \quad R_{4/12} = R_{12/4} = 1250 \times \frac{4,35}{2} = 2720 \text{ "}$$

$$R_{11/12} = R_{12/11} = 4020 \times \frac{3,65}{2} = 7340 \text{ " } \quad R_{5'/5} = R_{5/5'} = 1250 \times \frac{1,75}{2} = 1090 \text{ "}$$

$$R_{13/14} = R_{14/13} = 4020 \times \frac{3,95}{2} = 7940 \text{ " } \quad R_{5/13} = R_{13/5} = 1250 \times \frac{4,65}{2} = 2910 \text{ "}$$

$$R_{14/15} = R_{15/14} = 4020 \times \frac{3,70}{2} = 7440 \text{ " } \quad R_{12/20} = R_{20/12} = 1250 \times \frac{5,20}{2} = 3250 \text{ "}$$

$$R_{15/16} = R_{16/15} = 4020 \times \frac{3,90}{2} = 7840 \text{ " } \quad R_{13/21} = R_{21/13} = 1250 \times \frac{5,20}{2} = 3250 \text{ "}$$

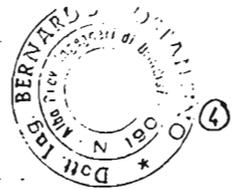
$$R_{17/18} = R_{18/17} = 3370 \times \frac{3,65}{2} = 6150 \text{ " } \quad R_{12/13} = R_{13/12} = 4440 \times \frac{3,10}{2} = 6880 \text{ "}$$

$$R_{18/19} = R_{19/18} = 3370 \times \frac{4,50}{2} = 7580 \text{ "}$$

$$R_{19/20} = R_{20/19} = 4530 \times \frac{3,65}{2} = 8270 \text{ "}$$

$$R_{21/22} = R_{22/21} = 4380 \times \frac{3,95}{2} = 8650 \text{ "}$$

CONTINUAZIONE SOLAIO TIPO



CALCOLO ORDITURA TRAVI-

TRAVE 1.2.3.4

TRATTO 1-2 $M = 3070 \times \frac{3,65^2}{11} = 3720 \text{ KgM}$; $\sqrt{M/b} = \sqrt{\frac{3720}{0,80}} = 63,93$; $c_h = \frac{22}{63,93} = 0,344$ $\frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 55 \text{ Kg/cm}^2$
 $A_f = A'_f = 0,00119 \times 63,93 \times 80 = 6,02 \text{ cm}^2$

TRATTO 2-3 $M = 3070 \times \frac{4,50^2}{12} = 5180$ " ; $\sqrt{M/b} = \sqrt{\frac{5180}{0,80}} = 80,47$; $c_h = \frac{22}{80,47} = 0,273$ $\frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 69$ "
 $A_f = A'_f = 0,00154 \times 80,47 \times 80 = 9,91 \text{ cm}^2$

TRATTO 3-4 $M = 4230 \times \frac{3,65^2}{11} = 5130$ " ; $\sqrt{M/b} = \sqrt{\frac{5130}{0,80}} = 80,08$; $c_h = \frac{22}{80,08} = 0,275$ $\frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 69$ "
 $A_f = A'_f = 0,00152 \times 80,08 \times 80 = 9,74 \text{ cm}^2$

TRAVE 5.6.7.8

TRATTO 5-6 $M = 4380 \times \frac{3,95^2}{11} = 6220 \text{ KgM}$; $\sqrt{M/b} = \sqrt{\frac{6220}{0,80}} = 88,18$; $c_h = \frac{22}{88,18} = 0,249$ $\frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 75 \text{ Kg/cm}^2$
 $A_f = A'_f = 0,00169 \times 88,18 \times 80 = 11,92 \text{ cm}^2$

TRATTO 6-7 $M = 3220 \times \frac{3,70^2}{12} = 3680$ " ; $\sqrt{M/b} = \sqrt{\frac{3680}{0,80}} = 67,82$; $c_h = \frac{22}{67,82} = 0,324$ $\frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 59$ "
 $A_f = A'_f = 0,00129 \times 67,82 \times 80 = 6,99 \text{ cm}^2$

TRATTO 7-8 $M = 3220 \times \frac{3,90^2}{11} = 4450$ " ; $\sqrt{M/b} = \sqrt{\frac{4450}{0,80}} = 74,58$; $c_h = \frac{22}{74,58} = 0,295$ $\frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 65$ "
 $A_f = A'_f = 0,00143 \times 74,58 \times 80 = 8,53 \text{ cm}^2$

TRAVE 17.18.19.20

TRATTO 17-18 $M = 3370 \times \frac{3,65^2}{11} = 4080 \text{ KgM}$; $\sqrt{M/b} = \sqrt{\frac{4080}{0,80}} = 71,41$; $c_h = \frac{22}{71,41} = 0,308$ $\frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 63$ "
 $A_f = A'_f = 0,00135 \times 71,41 \times 80 = 7,71 \text{ cm}^2$

TRATTO 18-19 $M = 3370 \times \frac{4,50^2}{12} = 5690$ " ; $\sqrt{M/b} = \sqrt{\frac{5690}{0,80}} = 84,33$; $c_h = \frac{22}{84,33} = 0,260$ $\frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 73$ "
 $A_f = A'_f = 0,00163 \times 84,33 \times 80 = 10,99 \text{ cm}^2$

TRATTO 19-20 $M = 4530 \times \frac{3,65^2}{11} = 5490$ " ; $\sqrt{M/b} = \sqrt{\frac{5490}{0,80}} = 82,84$; $c_h = \frac{22}{82,84} = 0,265$ $\frac{K_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 71$ "
 $A_f = A'_f = 0,00159 \times 82,84 \times 80 = 10,53 \text{ cm}^2$

TRAVE 21-22, 23, 24

TRATTO 21-22 $M = 4380 \times \frac{3,95^2}{11} = 6210 \text{ kNm}$; $\sqrt{H/b} = \sqrt{\frac{6210}{0,80}} = 88,10$; $c_n = \frac{22}{88,10} = 0,250$ $\frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 75 \text{ kN/cm}^2$
 $A_f = A'_f = 0,00169 \times 88,10 \times 80 = 11,91 \text{ cm}^2$

TRATTO 22-23 $M = 3220 \times \frac{3,70^2}{12} = 3680$ " $\sqrt{H/b} = \sqrt{\frac{3680}{0,80}} = 67,82$; $c_n = \frac{22}{67,82} = 0,324$ $\frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 59$ "
 $A_f = A'_f = 0,00127 \times 67,82 \times 80 = 6,89 \text{ cm}^2$

TRATTO 23-24 $M = 3220 \times \frac{3,9^2}{11} = 4450$ " $\sqrt{H/b} = \sqrt{\frac{4450}{0,80}} = 74,58$; $c_n = \frac{22}{74,58} = 0,294$ $\frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 65$ "
 $A_f = A'_f = 0,00143 \times 74,58 \times 80 = 8,53 \text{ cm}^2$

TRAVE 9-10-11-12

TRATTO 9-10 $M = 4020 \times \frac{3,65^2}{11} = 4870 \text{ kNm}$; $\sqrt{H/b} = \sqrt{\frac{4870}{0,80}} = 78,02$; $c_n = \frac{22}{78,02} = 0,282$ $\frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 67 \text{ kN/cm}^2$
 $A_f = A'_f = 0,00148 \times 78,02 \times 80 = 9,23 \text{ cm}^2$

TRATTO 10-11 $M = 4020 \times \frac{4,50^2}{12} = 6790$ " $\sqrt{H/b} = \sqrt{\frac{6790}{0,80}} = 92,13$; $c_n = \frac{22}{92,13} = 0,238$ $\frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 78$ "
 $A_f = A'_f = 0,00179 \times 92,13 \times 80 = 13,19 \text{ cm}^2$

TRATTO 11-12 $M = 4020 \times \frac{3,65^2}{11} = 4870$ " $\sqrt{H/b} = \sqrt{\frac{4870}{0,80}} = 78,02$; $c_n = \frac{22}{78,02} = 0,282$ $\frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 67$ "
 $A_f = A'_f = 0,00148 \times 78,02 \times 80 = 9,23 \text{ cm}^2$

TRAVE 13-14-15-16

TRATTO 13-14 $M = 4020 \times \frac{3,95^2}{11} = 5700 \text{ kNm}$; $\sqrt{H/b} = \sqrt{\frac{5700}{0,80}} = 84,41$; $c_n = \frac{22}{84,41} = 0,260$ $\frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 73 \text{ kN/cm}^2$
 $A_f = A'_f = 0,00160 \times 84,41 \times 80 = 10,82 \text{ cm}^2$

TRATTO 14-15 $M = 4020 \times \frac{3,70^2}{12} = 4590$ " $\sqrt{H/b} = \sqrt{\frac{4590}{0,80}} = 75,75$; $c_n = \frac{22}{75,75} = 0,290$ $\frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 65$ "
 $A_f = A'_f = 0,00143 \times 75,75 \times 80 = 8,66 \text{ cm}^2$

TRATTO 15-16 $M = 4020 \times \frac{3,90^2}{11} = 5560$ " $\sqrt{H/b} = \sqrt{\frac{5560}{0,80}} = 83,37$; $c_n = \frac{22}{83,37} = 0,263$ $\frac{V_f = 2600}{A_f = A'_f} \rightarrow \sigma_c \approx 72$ "
 $A_f = A'_f = 0,00160 \times 83,37 \times 80 = 10,67 \text{ cm}^2$



TRAVE 1.9.17

$$\text{TRATTO 1.9} \quad M = 1250 \times \frac{4,35^2}{8} = 2960 \text{ Kcm} ; \sqrt{H|b} = \sqrt{\frac{2960}{0,40}} = 86,02 ; c_h = \frac{22}{86,02} = 0,255 \xrightarrow{K_f - 2600} \sigma_c \approx 74 \text{ Kt/cm}^2$$

$$A_f = A'_f = 0,00160 \times 86,02 \times 40 = 5,50 \text{ cm}^2 \quad A'_f = A'_f$$

$$\text{TRATTO 9.17} \quad M = 1250 \times \frac{5,15^2}{10} = 3315 \text{ " ; } \sqrt{H|b} = \sqrt{\frac{3315}{0,40}} = 91,04 ; c_h = \frac{22}{91,04} = 0,241 \xrightarrow{K_f - 2600} \sigma_c \approx 77 \text{ "}$$

$$A_f = A'_f = 0,00175 \times 91,04 \times 40 = 6,37 \text{ cm}^2 \quad A'_f = A'_f$$

TRAVE B.16.24

$$\text{TRATTO B.16} \quad M = 1250 \times \frac{4,75^2}{6} = 2820 \text{ Kcm} ; \sqrt{H|b} = \sqrt{\frac{2820}{0,40}} = 83,97 ; c_h = \frac{22}{83,97} = 0,262 \xrightarrow{K_f - 2600} \sigma_c \approx 72 \text{ Kt/cm}^2$$

$$A_f = A'_f = 0,00160 \times 83,97 \times 40 = 5,37 \text{ cm}^2 \quad A'_f = A'_f$$

$$\text{TRATTO 16.24} \quad M = 1250 \times \frac{4,75^2}{10} = 2820 \text{ " ; } \sqrt{H|b} = \sqrt{\frac{2820}{0,40}} = 83,97 ; c_h = \frac{22}{83,97} = 0,262 \xrightarrow{K_f - 2600} \sigma_c \approx 72 \text{ "}$$

$$A_f = A'_f = 0,00160 \times 83,97 \times 40 = 5,37 \text{ cm}^2 \quad A'_f = A'_f$$

TRAVE 4'.4.12

$$\text{TRATTO 4'.4} \quad M = 1250 \times \frac{1,75^2}{8} = 480 \text{ Kcm} ; \sqrt{H|b} = \sqrt{\frac{480}{0,40}} = 34,64 ; c_h = \frac{22}{34,64} = 0,635$$

$$A_f = A'_f =$$

$$\text{TRATTO 4.12} \quad M = 1250 \times \frac{4,35^2}{6} = 2365 \text{ " ; } \sqrt{H|b} = \sqrt{\frac{2365}{0,40}} = 76,90 ; c_h = \frac{22}{76,90} = 0,286 \xrightarrow{K_f - 2600} \sigma_c \approx 66 \text{ Kt/cm}^2$$

$$A_f = A'_f = 0,00147 \times 76,90 \times 40 = 4,52 \text{ cm}^2 \quad A'_f = A'_f$$

TRAVE 5'.5.13

$$\text{TRATTO 5'.5} \quad M = 1250 \times \frac{1,75^2}{8} = 480 \text{ Kcm} ; \sqrt{H|b} = \sqrt{\frac{480}{0,40}} = 34,64 ; c_h = \frac{22}{34,64} = 0,635$$

$$A_f = A'_f =$$

$$\text{TRATTO 5.13} \quad M = 1250 \times \frac{4,65^2}{10} = 2710 \text{ " ; } \sqrt{H|b} = \sqrt{\frac{2710}{0,40}} = 82,20 ; c_h = \frac{22}{82,20} = 0,267 \xrightarrow{K_f - 2600} \sigma_c \approx 70 \text{ Kt/cm}^2$$

$$A_f = A'_f = 0,00156 \times 82,20 \times 40 = 5,13 \text{ cm}^2 \quad A'_f = A'_f$$

$$\text{TRAVE 4'.5'} \quad M = 4500 \times \frac{3,10^2}{11} = 3930 \text{ " ; } \sqrt{H|b} = \sqrt{\frac{3930}{0,30}} = 114,45 ; c_h = \frac{37}{114,45} = 0,323 \xrightarrow{K_f - 2600} \sigma_c \approx 65 \text{ Kt/cm}^2$$

$$A_f = 0,00130 \times 114,45 \times 30 = 4,46 \text{ cm}^2 ; A'_f = \frac{114,45}{2,23} \text{ cm}^2 \quad A'_f = 0,5 A_f$$

$$\text{TRAVE 12.13} \quad M = 4440 \times \frac{3,10^2}{11} = 3885 \text{ " ; } \sqrt{H|b} = \sqrt{\frac{3885}{0,80}} = 69,64 ; c_h = \frac{22}{69,64} = 0,316 \xrightarrow{K_f - 2600} \sigma_c \approx 60 \text{ Kt/cm}^2$$

$$A_f = A'_f = 0,00133 \times 69,64 \times 80 = 7,40 \text{ cm}^2 \quad A'_f = A'_f$$

- VICEPILOGO PILASTRI PIANO TIPO -

PILASTRO

1	$R_{1/2} + R_{1/9}$	= 5600 + 2720	= 8320	K4.
2	$R_{2/1} + R_{2/3}$	= 5600 + 6910	= 12.510	"
3	$R_{3/2} + R_{3/4}$	= 6910 + 7720	= 14.630	"
4	$R_{4/3} + R_{4/4'} + \dots + R_{4/12}$	= 7720 + 1090 + — + 2720	= 11.530	"
4'	$R_{4'/4} + R_{4'/5'}$	= 1090 + 6980	= 8.070	"
5	$R_{5/5'} + R_{5/6} + R_{5/13}$	= — + 1090 + 8650 + 2910	= 12.650	"
5'	$R_{5'/4'} + R_{5'/5}$	= 6980 + 1090	= 8.070	"
6	$R_{6/5} + R_{6/7}$	= 8650 + 5960	= 14.610	"
7	$R_{7/6} + R_{7/8}$	= 5960 + 6280	= 12.240	"
8	$R_{8/7} + R_{8/16}$	= 6280 + 2970	= 9.250	"
9	$R_{9/1} + R_{9/10} + R_{9/17}$	= 2720 + 7340 + 3220	= 13.280	"
10	$R_{10/9} + R_{10/11}$	= 7340 + 9050	= 16.390	"
11	$R_{11/10} + R_{11/12}$	= 9050 + 7340	= 16.390	"
12	$R_{12/11} + R_{12/4} + R_{12/13} + \frac{1}{3} R_{12/20}$	= 7340 + 2720 + 6880 + 1100	= 18.040	"
13	$R_{13/12} + R_{13/15} + R_{13/16} + \frac{1}{3} R_{13/21}$	= 6880 + 2910 + 7740 + 1100	= 18.830	"
14	$R_{14/13} + R_{14/15}$	= 7740 + 7440	= 15.380	"
15	$R_{15/14} + R_{15/16}$	= 7440 + 7840	= 15.280	"
16	$R_{16/15} + R_{16/8} + R_{16/24}$	= 7840 + 2970 + 2970	= 13.780	"
17	$R_{17/9} + R_{17/18}$	= 3220 + 6150	= 9.370	"
18	$R_{18/17} + R_{18/19}$	= 6150 + 7580	= 13.730	"
19	$R_{19/18} + R_{19/20}$	= 7580 + 8270	= 15.850	"
20	$R_{20/19} + \frac{1}{3} R_{20/12}$	= 8270 + 1100	= 9.370	"
21	$\frac{1}{3} R_{21/13} + R_{21/22}$	= 1100 + 8650	= 9.750	"
22	$R_{22/21} + R_{22/23}$	= 8650 + 5960	= 14.610	"
23	$R_{23/22} + R_{23/24}$	= 5960 + 6280	= 12.240	"
24	$R_{24/23} + R_{24/16}$	= 6280 + 2970	= 9.250	"

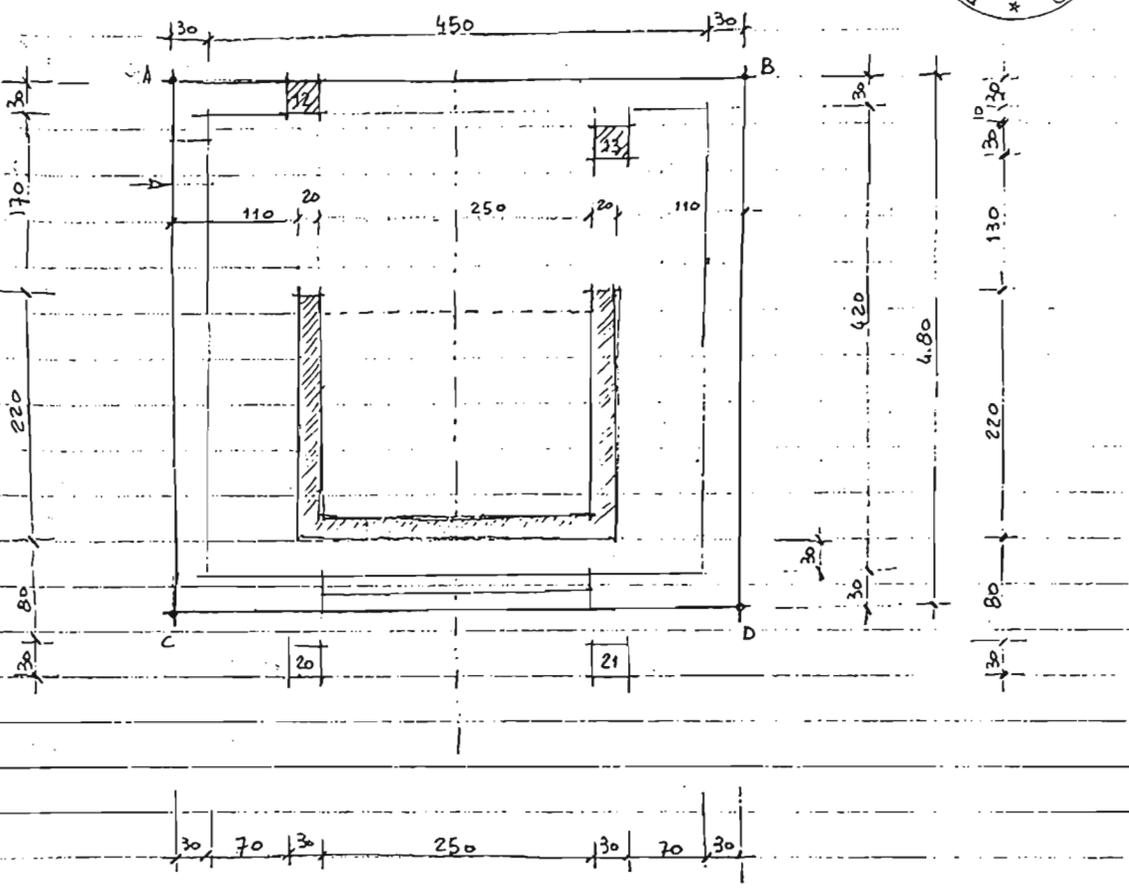
~~—————~~

DA SOSTITUIRE QUANDO SI VA A COLLEGARE DETTAGLIATAMENTE LA COPERTURA
DEL VANO SCALA E I SOLAI A QUOTA +16.26 E +19.16 DELLA SALA
MACCHINE.

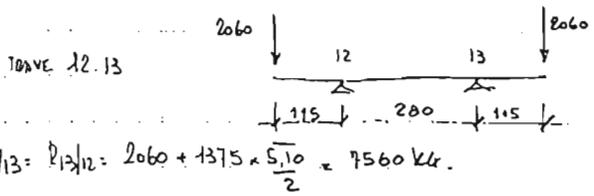




SALA MACCHINE ASCENSORI SOLAIO A QUOTA + 16,26 (PAVIMENTO SALI MACCHINE)

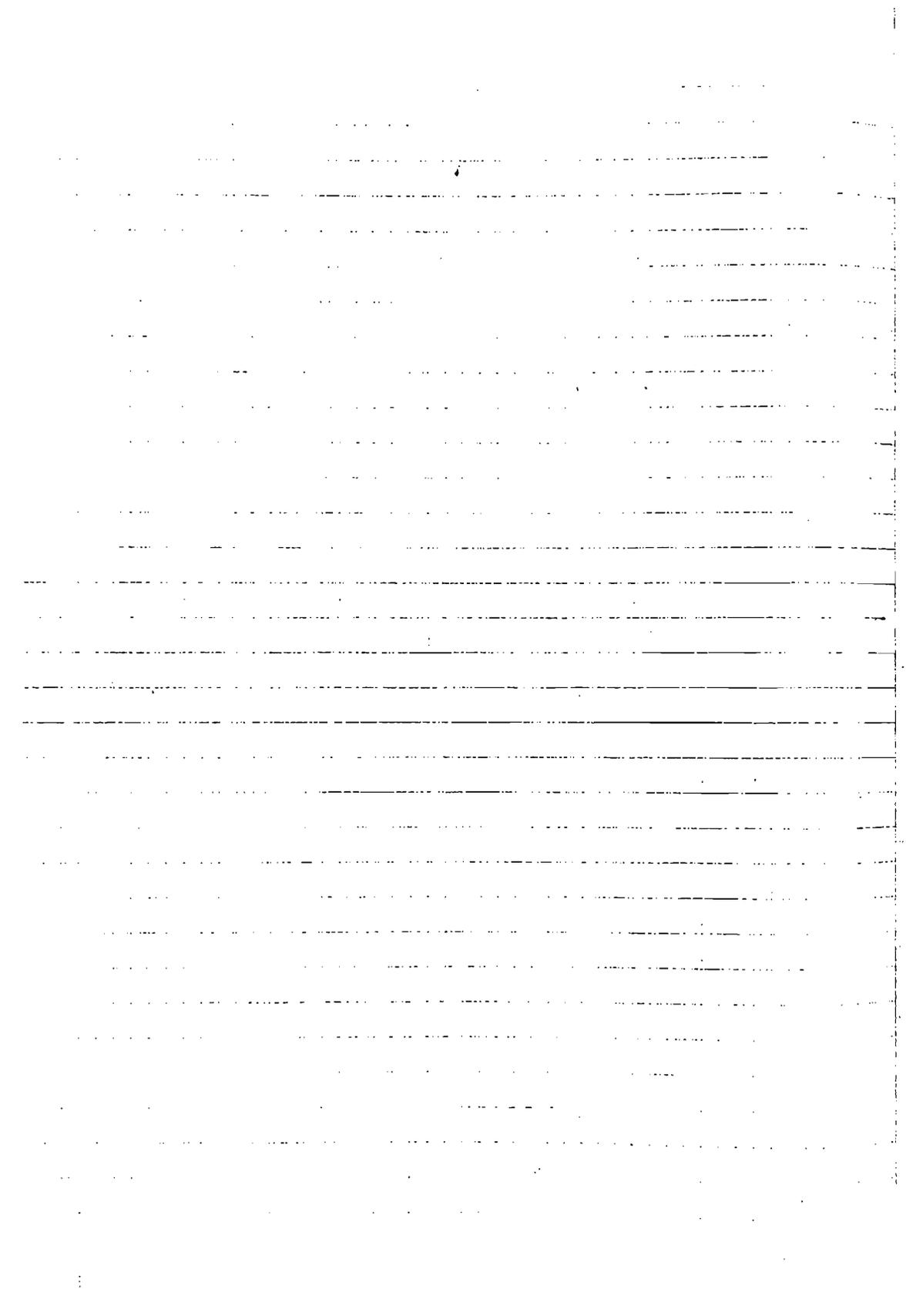


H.B.: IL SOLAIO A QUOTA + 16,26 È PERMETRATO DA A-B-C-D. ALL'INTERNO CORRE LA MURATURA DA CH 30 CHE PORTERÀ IL SOLAIO A QUOTA + 19,16. CIOÈ IL SOLAIO A QUOTA + 19,16 SARÀ PORTATO DALLA MURATURA DI SP = 30 CM POGGIANTE PERIMETRALMENTE AL SOLAIO A + 16,26 (A-B-C-D). SICCHÈ CONVIENE PARTIRE DA QUOTA + 19,16 E FOL SCENDERE A QUOTA + 16,26. CONVIENE A QUOTA + 16,26 GETTARE TUTTA UNA SOLETTA.



$$P_{12/13} = P_{13/12} = 2060 + 1375 \times \frac{5,10}{2} = 7560 \text{ Kg.}$$

MURATURA = 1000,00 Kg/m³
 PESO PROPRIO:
 $0,60 \times 0,25 \times 1,00 \times 2500 = 375,00 \text{ Kg}$
 1375,00 Kg





RICAPITOLO PILASTRI PORTANTI IL SOLAIO A QUOTA

PILASTRO	+ 15.35		+ 12.01	
		Acci		Acci
1	5210 + 700 = 5910 Kg	99 cm ²	5910 + 8320 + 700 = 14.930 Kg	251 cm ²
2	8600 + 700 = 9300 "	156 "	9300 + 12510 + 700 = 22.510 "	378 "
3	10.300 + 700 = 11000 "	185 "	11.000 + 14.630 + 700 = 26.330 "	442 "
4	9.390 + 700 = 10090 "	169 "	10.090 + 11.530 + 700 = 22.320 "	375 "
5	10.270 + 700 = 10970 "	185 "	10.970 + 12.650 + 700 = 24.320 "	409 "
6	10.410 + 700 = 11.110 "	187 "	11.110 + 14.610 + 700 = 26.420 "	444 "
7	8.520 + 700 = 9.220 "	155 "	9.220 + 12.240 + 700 = 22.160 "	373 "
8	5.860 + 700 = 6.560 "	110 "	6.560 + 9.250 + 700 = 16.510 "	278 "
9	9.190 + 700 = 9.890 "	166 "	9.890 + 13.280 + 700 = 23.870 "	401 "
10	13.880 + 700 = 14.580 "	245 "	14.580 + 16.390 + 700 = 31.670 "	532 "
11	13.880 + 700 = 14.580 "	245 "	14.580 + 16.390 + 700 = 31.670 "	532 "
12	8.940 + 700 = 9.640 "	162 "	9.640 + 18.040 + 700 = 28.380 "	477 "
13	9.640 + 700 = 10.340 "	174 "	10.340 + 18.830 + 700 = 29.870 "	502 "
14	13.030 + 700 = 13.730 "	230 "	13.730 + 15.380 + 700 = 29.810 "	501 "
15	12.940 + 700 = 13.640 "	229 "	13.640 + 15.280 + 700 = 29.620 "	498 "
16	9.620 + 700 = 10.320 "	174 "	10.320 + 13.780 + 700 = 24.800 "	417 "
17	5.920 + 700 = 6.620 "	112 "	6.620 + 9.370 + 700 = 16.690 "	280 "
18	9.620 + 700 = 10.320 "	173 "	10.320 + 13.730 + 700 = 24.750 "	416 "
19	11.330 + 700 = 12.030 "	202 "	12.030 + 15.850 + 700 = 28.580 "	480 "
20	6.020 + 700 = 6.720 "	113 "	6.720 + 9.370 + 700 = 16.790 "	282 "
21	6.260 + 700 = 6.960 "	117 "	6.960 + 9.750 + 700 = 17.410 "	292 "
22	10.410 + 700 = 11.110 "	187 "	11.110 + 14.610 + 700 = 26.420 "	444 "
23	8.520 + 700 = 9.220 "	155 "	9.220 + 12.240 + 700 = 22.160 "	373 "
24	5.860 + 700 = 6.560 "	110 "	6.560 + 9.250 + 700 = 16.510 "	278 "
4'	1.100 + 700 = 1.800 "		1.800 + 8.070 + 700 = 10.570 "	178 "
5'	1.100 + 700 = 1.800 "		1.800 + 8.070 + 700 = 10.570 "	178 "

CONTINUAZIONE RICAPITOLO PILASTRI PERTINENTI IL SOLAIO A QUOTA:

+ 8.97

+ 5.93

PILASTRO		Acq		Acq
1	14.930 + 8320 + 700 = 23.950 Kg.	402 cm ²	23.950 + 8320 + 700 = 32.970 Kg	554
2	22.510 + 12510 + 700 = 35.720 "	600 "	35.720 + 12510 + 700 = 48.930 "	822
3	26.330 + 14630 + 700 = 41.660 "	700 "	41.660 + 14630 + 700 = 56.990 "	<u>958</u>
4	22.320 + 11530 + 700 = 34.550 "	580 "	34.550 + 11530 + 700 = 46.780 "	786
5	24.320 + 12650 + 700 = 37.670 "	633 "	37.670 + 12650 + 700 = 51.020 "	857
6	26.420 + 14610 + 700 = 41.730 "	701 "	41.730 + 14610 + 700 = 57.040 "	<u>959</u>
7	22.160 + 12240 + 700 = 35.100 "	590 "	35.100 + 12240 + 700 = 48.040 "	807
8	16.510 + 9250 + 700 = 26.460 "	444 "	26.460 + 9250 + 700 = 36.410 "	612
9	23.870 + 13280 + 700 = 37.850 "	636 "	37.850 + 13280 + 700 = 51.830 "	871
10	31.670 + 16390 + 700 = 48.760 "	819 "	48.760 + 16390 + 700 = 65.850 "	<u>1106</u>
11	31.670 + 16390 + 700 = 48.760 "	819 "	48.760 + 16390 + 700 = 65.850 "	<u>1106</u>
12	20.380 + 18040 + 700 = 47.120 "	792 "	47.120 + 18040 + 700 = 65.860 "	1107
13	29.870 + 18830 + 700 = 49.400 "	830 "	49.400 + 18830 + 700 = 68.930 "	<u>1158</u>
14	29.810 + 15380 + 700 = 45.890 "	771 "	45.890 + 15380 + 700 = 61.970 "	<u>1041</u>
15	29.620 + 15280 + 700 = 45.600 "	766 "	45.600 + 15280 + 700 = 61.580 "	<u>1035</u>
16	24.800 + 13780 + 700 = 39.280 "	660 "	39.280 + 13780 + 700 = 53.760 "	<u>903</u>
17	16.680 + 9370 + 700 = 26.760 "	450 "	26.760 + 9370 + 700 = 36.830 "	619
18	24.750 + 13730 + 700 = 39.180 "	658 "	39.180 + 13730 + 700 = 53.610 "	<u>901</u>
19	28.580 + 15850 + 700 = 45.130 "	758 "	45.130 + 15850 + 700 = 61.680 "	<u>1036</u>
20	16.790 + 9370 + 700 = 26.860 "	451 "	26.860 + 9370 + 700 = 36.930 "	621
21	17.410 + 9750 + 700 = 27.860 "	468 "	27.860 + 9750 + 700 = 38.310 "	644
22	26.420 + 14610 + 700 = 41.730 "	701 "	41.730 + 14610 + 700 = 57.040 "	<u>959</u>
23	22.160 + 12240 + 700 = 35.100 "	590 "	35.100 + 12240 + 700 = 48.040 "	808
24	16.510 + 9250 + 700 = 26.460 "	444 "	26.460 + 9250 + 700 = 36.410 "	612
4'	10.570 + 8070 + 700 = 19.340 "	325 "	19.340 + 8070 + 700 = 28.110 "	473
5'	10.570 + 8070 + 700 = 19.340 "	325 "	19.340 + 8070 + 700 = 28.110 "	473

CONTINUAZIONE RIEPILOGO PIASTRE PORTANTI IL SOGLIO A QUOTA :

+ 2.89

PIASTRE

Ac

706 cm²

1 32.970 + 8320 + 700 = 41.990 Kg

2 48.930 + 12510 + 700 = 62.140 "

3 56.990 + 14630 + 700 = 72.320 "

4 46.780 + 11530 + 700 = 59.010 "

5 51.020 + 12650 + 700 = 64.370 "

6 57.040 + 14610 + 700 = 72.350 "

7 48.040 + 12.240 + 700 = 60.980 "

8 36.410 + 9250 + 700 = 46.360 "

9 51.830 + 13280 + 700 = 65.810 "

10 65.850 + 16390 + 700 = 82.940 "

11 65.850 + 16390 + 700 = 82.940 "

12 65.860 + 18040 + 700 = 84.600 "

13 68.930 + 18830 + 700 = 88.460 "

14 61.970 + 15380 + 700 = 78.050 "

15 61.580 + 15280 + 700 = 77.560 "

16 53.760 + 13780 + 700 = 68.240 "

17 36.830 + 9370 + 700 = 46.900 "

18 53.610 + 13730 + 700 = 68.040 "

19 61.860 + 15850 + 700 = 78.410 "

20 36.930 + 9370 + 700 = 47.000 "

21 38.310 + 9750 + 700 = 48.760 "

22 57.040 + 14610 + 700 = 72.350 "

23 48.040 + 12240 + 700 = 60.980 "

24 36.410 + 9250 + 700 = 46.360 "

4¹ 28.110 + 8070 + 700 = 36.880 "

5¹ 28.110 + 8070 + 700 = 36.880 "

1044 "

1216 "

992 "

1082 "

1216 "

1025 "

780 "

1106 "

1394 "

1394 "

1422 "

1487 "

1312 "

1304 "

1147 "

788 "

1144 "

1318 "

790 "

820 "

1216 "

1025 "

779 "

620 "

620 "



- FONDAZIONI -

- TRAVE (1-8) L = 26,05 ML

$$\Sigma P = P_1 + P_2 + P_3 + P_4 + P_5 + P_6 + P_7 + P_8 =$$

$$= 41990 + 62140 + 92320 + 59.010 + 64.370 + 72350 + 60.980 + 46360 = 479.520 \text{ Kg}$$

$$P/ML = \frac{\Sigma P}{L} = \frac{479.520}{26,05} = 18.400 \text{ Kg/ml}$$

- TRAVE (9-16) L = 26,05 ML

$$\Sigma P = P_9 + P_{10} + P_{11} + P_{12} + P_{13} + P_{14} + P_{15} + P_{16} =$$

$$= 65810 + 82940 + 82940 + 84600 + 88460 + 78050 + 77560 + 68240 = 628.600 \text{ Kg}$$

$$P/ML = \frac{\Sigma P}{L} = \frac{628.600}{26,05} = 24.100 \text{ Kg/ml}$$

- TRAVE (17-24) L = 26,05 ML

$$\Sigma P = P_{17} + P_{18} + P_{19} + P_{20} + P_{21} + P_{22} + P_{23} + P_{24} =$$

$$= 46900 + 68040 + 78410 + 47000 + 48760 + 72.350 + 60.980 + 46360 = 468.800 \text{ Kg}$$

$$P/ML = \frac{\Sigma P}{L} = \frac{468.800}{26,05} = 18.000 \text{ Kg/ML}$$

- TRAVE (1.17) L = 9,70 ML

$$\Sigma P = P_1 + P_9 + P_{17} = 41.990 + 65.810 + 46.900 = 154.700 \text{ Kg}$$

$$P/ML = \frac{\Sigma P}{L} = \frac{154.700}{9,70} = 16.000 \text{ Kg/ML}$$

CONTINUAZIONE FONDAZIONI



⑦

TRAVE (4'-20) L = 11,20 ML.

$$\Sigma P = P_{41} + P_{44} + P_{12} + P_{20} = 36.880 + 59.010 + 84.600 + 47.000 = 227.500 \text{ Kg.}$$

$$P/ML = \frac{\Sigma P}{L} = \frac{227.500}{11,20} = 20.300 \text{ Kg/ML.}$$

TRAVE (5'-21) L = 11,20 ML

$$\Sigma P = P_{51} + P_{55} + P_{13} + P_{21} = 36.880 + 64.370 + 88.460 + 48.760 = 238.500 \text{ Kg.}$$

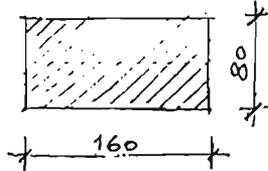
$$P/ML = \frac{\Sigma P}{L} = \frac{238.500}{11,20} = 21.300 \text{ Kg/ML}$$

TRAVE (8'-24) L = 9,70 ML

$$\Sigma P = P_8 + P_{16} + P_{24} = 46.360 + 68.240 + 46.360 = 161.000 \text{ Kg.}$$

$$P/ML = \frac{\Sigma P}{L} = \frac{161.000}{9,70} = 16.600 \text{ Kg/ML.}$$

TRAVE (1-8)



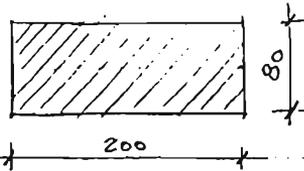
$$\text{PESO PROPRIO} = 1,60 \times 0,80 \times 1,00 \times 2500 = 3200 \text{ KG/ML}$$

SOVRACCARICO

$$= 18400 \text{ "}$$
$$\underline{\hspace{1cm}}$$
$$21.600 \text{ KG/ML}$$

$$p_t = \frac{21.600}{160 \times 100} = 1,35 \text{ KG/cm}^2$$

TRAVE (9-16)



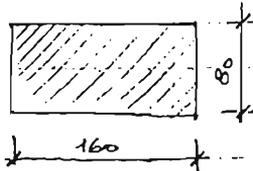
$$\text{PESO PROPRIO} = 2,00 \times 0,80 \times 1,00 \times 2500 = 4000 \text{ KG/ML}$$

SOVRACCARICO

$$= 24100 \text{ "}$$
$$\underline{\hspace{1cm}}$$
$$28100 \text{ KG/ML}$$

$$p_t = \frac{28100}{200 \times 80} = 1,76 \text{ KG/cm}^2$$

TRAVE (17-24)

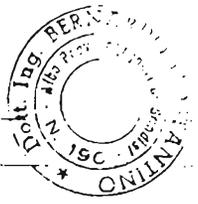


$$\text{PESO PROPRIO} = 3200 \text{ KG/ML}$$

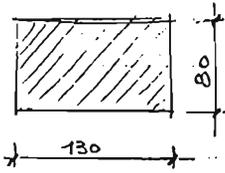
SOVRACCARICO

$$= 18000 \text{ "}$$
$$\underline{\hspace{1cm}}$$
$$21.200 \text{ KG/ML}$$

$$p_t = \frac{21.200}{160 \times 100} = 1,33 \text{ KG/cm}^2$$



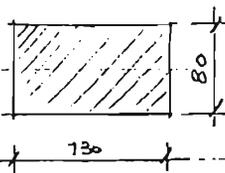
- TRAVE (1-17)



PESO PROPRIO = $1,30 \times 0,80 \times 1,00 \times 2500 = 2600 \text{ Kg/ML}$
 SOVRACCARICO = 16000 "
 18600 Kg/ML

$p_t = \frac{18600}{130 \times 100} = 1,43 \text{ Kg/cm}^2$

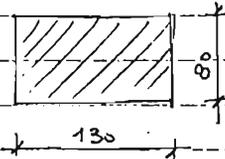
- TRAVE (8-24)



PESO PROPRIO = 2600 Kg/ML
 SOVRACCARICO = 16600 "
 19.200 Kg/ML

$p_t = \frac{19.200}{130 \times 100} = 1,48 \text{ Kg/cm}^2$

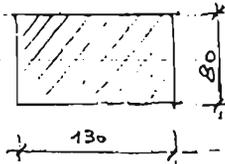
- TRAVE (4'-20)



PESO PROPRIO = 2600 Kg/ML
 SOVRACCARICO = 20300 "
 22.900 Kg/ML

$p_t = \frac{22.900}{130 \times 100} = 1,76 \text{ Kg/cm}^2$ (in effetti tale valore è minore in quanto i pilastri 4-12-20 sono interessati da altre travi.)

- TRAVE (5'-21)



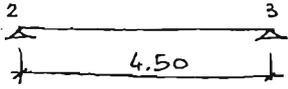
PESO PROPRIO = 2600 Kg/ML
 SOVRACCARICO = 21300 "
 23.900 Kg/ML

$p_t = \frac{23.900}{130 \times 100} = 1,84 \text{ Kg/cm}^2$ (in effetti tale valore è minore per gli stessi motivi della trave 4'-20).

- CALCOLO ORDITORE -

- TRAVE (1-8)

TRATTO [2-3]

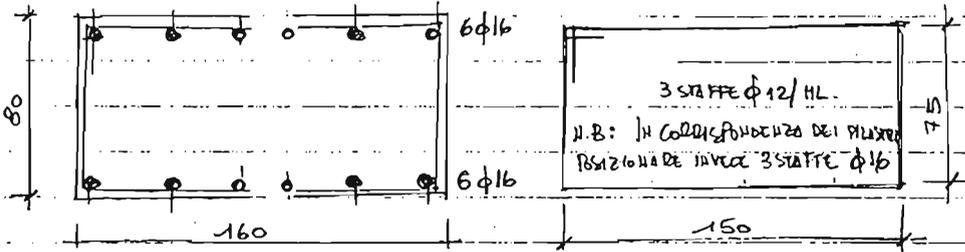


$$M = \frac{q l^2}{12} = \frac{18400 \times 4,50^2}{12} = 31.050 \text{ Kcm}$$

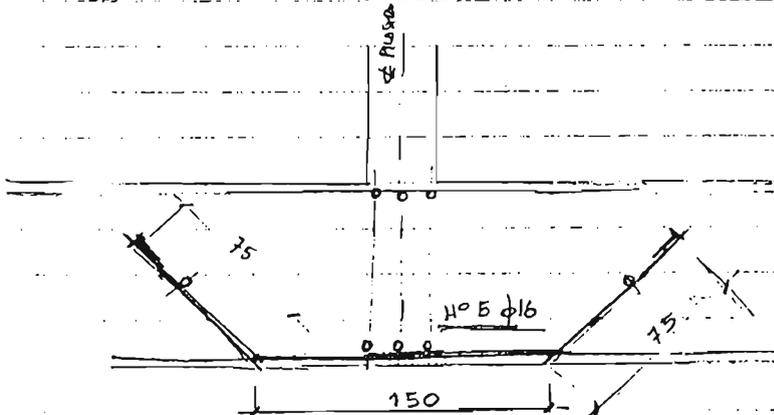
$$\sqrt{\frac{M}{b}} = \sqrt{\frac{31.050}{1,60}} = 139,30; \quad c_n = \frac{76}{139,30} = 0,545 \quad \begin{matrix} \chi_f = 2600 \\ A'_f = 0,5 A_f \end{matrix} \rightarrow \sigma_c < 50 \text{ Kg/cm}^2 \quad (\approx 35 \text{ "})$$

$$A_f = 0,00090 \times 139,30 \times 160 = 20,05 \text{ cm}^2 \quad (10 \phi 16 = 20,11 \text{ cm}^2)$$

$$A'_f = 0,5 A_f = 0,5 \times 20,05 = 10,03 \text{ "} \quad (5 \phi 16 = 10,05 \text{ cm}^2)$$



IN CORRISPONDENZA DEI PILASTRI 2 E 3 POSIZIONARE N° 5 CAVALOTTI $\phi 16$



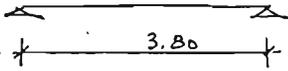
$$T_{max} = 18400 \times \frac{4,50}{2} = 41.400 \text{ Kg}; \quad \tau_{max} = \frac{T_{max}}{b h_0} = \frac{41.400}{160 \times 0,9 \times 76} = 3,78 \text{ Kg/cm}^2 < 5,33$$

CONTINUAZIONE FONDAZIONI.

(8)

TRAVE (1-B).

ALTRI TRATTI:

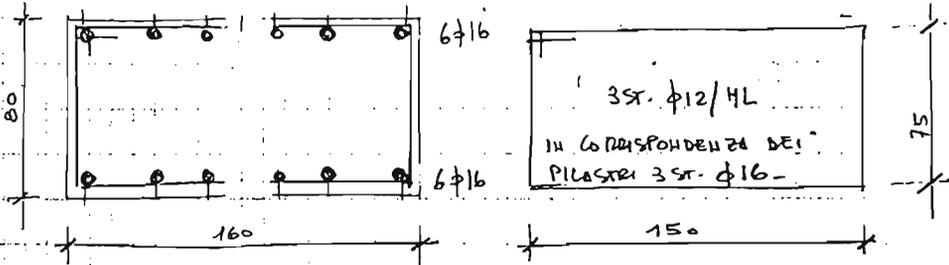


$$M = \frac{q l^2}{12} = \frac{18400 \times 3.80^2}{12} = 22.141 \text{ KgM.}$$

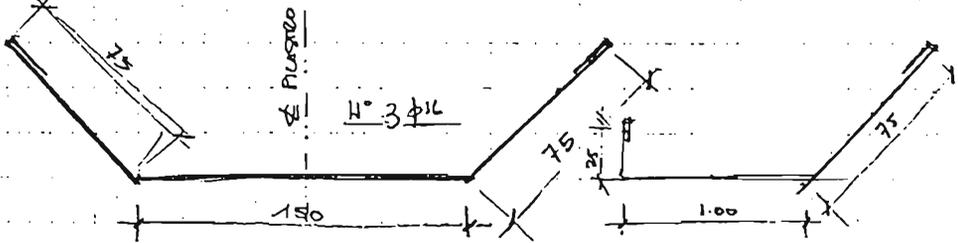
$$\sqrt{\frac{M}{b}} = \sqrt{\frac{22.141}{160}} = 117.63; \quad c_h = \frac{76}{117.63} = 0.646 \quad \frac{V_f = 2600}{A_f = 0.5 A_f} \quad \sigma_c = < 50 \text{ Kg/cm}^2 \quad (\sim 35 \text{ Kg/cm}^2)$$

$$A_f = 0.00085 \times 117.63 \times 160 = 15.99 \text{ cm}^2 \quad \rightarrow \quad 8 \phi 16 = 16.08 \text{ cm}^2$$

$$f = 0.5 \times 15.99 = 8.00 \text{ cm}^2 \quad \rightarrow \quad 5 \phi 16 = 10.05 \text{ cm}^2$$



IN CORRESPONDENZA DEI PILASTRI POSIZIONARE N° 3 CAVALOTTI φ16

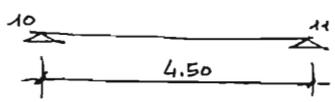


VE (17-24) - VEDI TRAVE PRECEDUTE (1-B)



TRAVE (9-16)

TRATTO [10-11]



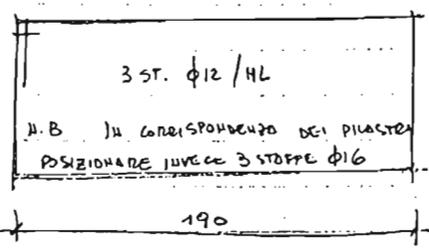
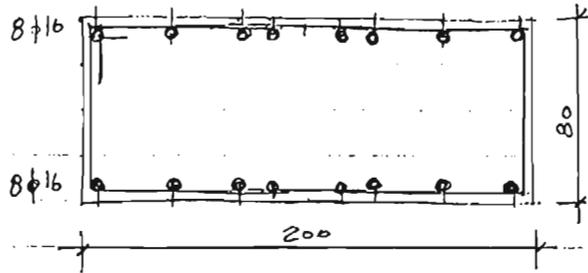
$$M = \frac{qL^2}{12} = \frac{24 \cdot 100 \times 4,50^2}{12} = 40.668 \text{ KgM}$$

$$\sqrt{\frac{M}{b}} = \sqrt{\frac{40668}{2,00}} = 142,60 ; c_n = \frac{76}{142,60} = 0,534$$

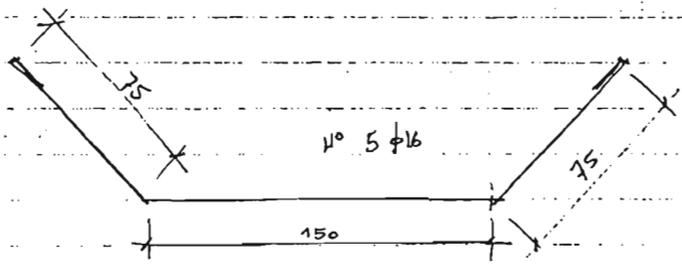
$$k_f = \frac{2600}{\Delta f} = 0,5 \Delta f \rightarrow \sigma_c < 50 \text{ Kg/cm}^2 \quad (\sigma_c = 40 \text{ Kg/cm}^2)$$

$$A_f \approx 0,00090 \times 142,60 \times 200 = 25,66 \text{ cm}^2 \rightarrow 13 \phi 16 = 26,13 \text{ cm}^2$$

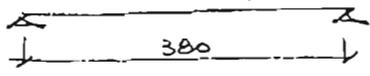
$$A_f' = 0,5 A_f = 0,5 \times 25,66 = 12,83 \text{ cm}^2 \rightarrow 7 \phi 16 = 14,07 \text{ cm}^2$$



IN CORRISPONDENZA DEI PILASTRI 10 E 11 POSIZIONARE N° 5 CAVALLOTTI phi 16 -



ALTRI TRATTI



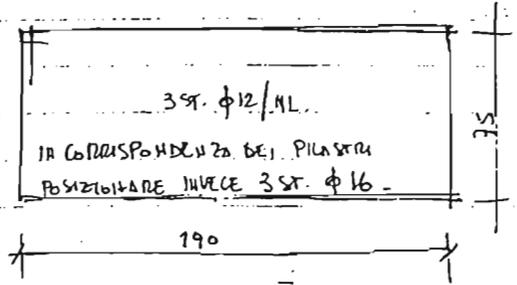
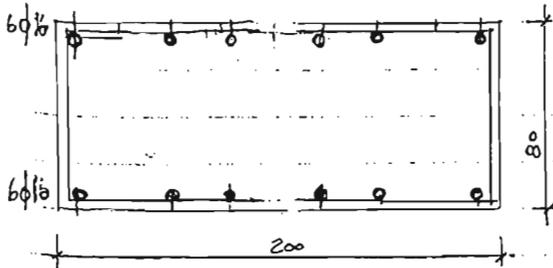
$$M = \frac{qL^2}{12} = \frac{24 \cdot 100 \times 3,80^2}{12} = 29.000 \text{ KgM}$$

$$\sqrt{\frac{M}{b}} = \sqrt{\frac{29000}{2,00}} = 120,41 ; c_n = \frac{76}{120,41} = 0,631$$

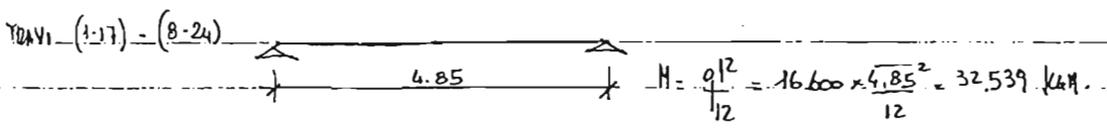
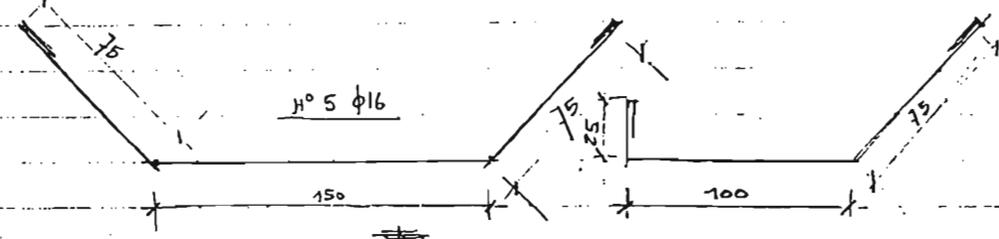
$$k_f = \frac{2600}{\Delta f} = 0,5 \Delta f \rightarrow \sigma_c < 50 \text{ Kg/cm}^2 \quad (\approx 30 \text{ Kg/cm}^2)$$

$$A_f \approx 0,00080 \times 120,41 \times 200 = 19,26 \text{ cm}^2 ; 10 \phi 16 = 20,10 \text{ cm}^2$$

$$A_f' = 0,5 A_f = 0,5 \times 19,26 = 9,63 \text{ " ; } 5 \phi 16 = 10,05 \text{ "}$$



IN CORRISPONDENZA DEI PILASTRI POSIZIONARE N° 5 CAVALLOTTI φ16 -

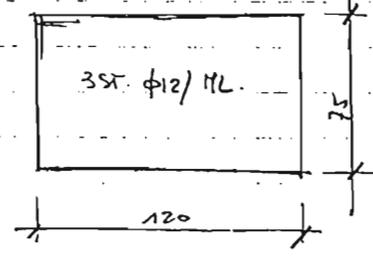
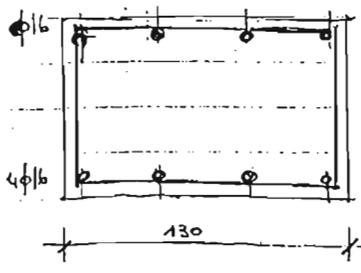


$$\frac{M}{B} = \frac{32539}{1.30} = 158.21, \quad c_h = \frac{76}{158.21} = 0.480, \quad \chi_f = \frac{2600}{12} = 216.67, \quad \sigma_c = 40 \text{ Kt/cm}^2$$

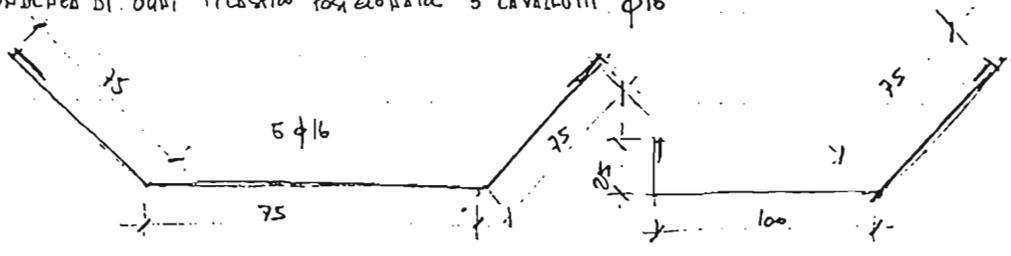
$$A_f = 0.511$$

$$A_f = 0.00085 \times 158.21 \times 130 = 17.48 \text{ cm}^2 \rightarrow 9 \phi 16 = 18.09 \text{ cm}^2$$

$$A_f = 0.5 \times 17.48 = 8.74 \text{ cm}^2 \rightarrow 4 \phi 16 = 8.04 \text{ cm}^2$$



IN CORRISPONDENZA DI OGNI PILASTRO POSIZIONARE 5 CAVALLOTTI φ16



$$\text{TRAVI } (4 \cdot 20) - (5 \cdot 21)$$

$$\text{VEDI } \text{TRAVI } (4 \cdot 17) - (8 \cdot 24)$$

~~—————~~

PILASTRI PIANO TERZA (Solario + 2.89)

	A_{ci}	$A_j = 0,8\% A_{ci}$	A_R	$A_{jR} \geq 0,3\% A_R$	STAFFE
1	706 cm ²	5,65 cm ²	30 x 40	4 ϕ 16 = 8,04 cm ²	ϕ 8/24"
2	1044 "	8,35 "	30 x 40	6 ϕ 16 = 12,06 "	"
3	1216 "	9,73 "	30 x 50	6 ϕ 16 = 12,06 "	"
4	992 "	7,94 "	30 x 40	6 ϕ 16 = 12,06 "	"
5	1082 "	8,66 "	30 x 40	6 ϕ 16 = 12,06 "	"
6	1216 "	9,73 "	30 x 50	6 ϕ 16 = 12,06 "	"
7	1025 "	8,20 "	30 x 40	6 ϕ 16 = 12,06 "	"
8	780 "	6,24 "	30 x 40	4 ϕ 16 = 8,04 "	"
9	1106 "	8,85 "	30 x 40	6 ϕ 16 = 12,06 "	"
10	1394 "	11,15 "	30 x 50	6 ϕ 16 = 12,06 "	"
11	1394 "	11,15 "	30 x 50	6 ϕ 16 = 12,06 "	"
12	1422 "	11,37 "	30 x 60	8 ϕ 16 = 16,08 "	"
13	1487 "	11,89 "	30 x 60	8 ϕ 16 = 16,08 "	"
14	1312 "	10,50 "	30 x 50	6 ϕ 16 = 12,06 "	"
15	1304 "	10,43 "	30 x 50	6 ϕ 16 = 12,06 "	"
16	1147 "	9,18 "	30 x 40	6 ϕ 16 = 12,06 "	"
17	788 "	6,30 "	30 x 40	4 ϕ 16 = 8,04 "	"
18	1144 "	9,15 "	30 x 40	6 ϕ 16 = 12,06 "	"
19	1318 "	10,54 "	30 x 50	6 ϕ 16 = 12,06 "	"
20	730 "	6,32 "	30 x 40	4 ϕ 16 = 8,04 "	"
21	820 "	6,56 "	30 x 40	4 ϕ 16 = 8,04 "	"
22	1216 "	9,73 "	30 x 50	6 ϕ 16 = 12,06 "	"
23	1025 "	8,20 "	30 x 40	6 ϕ 16 = 12,06 "	"
24	779 "	6,23 "	30 x 40	4 ϕ 16 = 8,04 "	"
4'	620 "	4,96 "	30 x 30	4 ϕ 16 = 8,04 "	"
5'	620 "	4,96 "	30 x 30	4 ϕ 16 = 8,04 "	"



PILASTRI PIANO PRIMO (SOLAI A + B, 9.3)

Acq.	$A_f = 0,8\% A_{ci}$	AR	$A_f R \geq 0,3\% A_R$	STAFFE
554 cm^2	4,43 cm^2	30 x 30 = 900 cm^2	4 ϕ 16 = 8,04 cm^2	ϕ 8 / 20"
822 "	6,58 "	30 x 40	4 ϕ 16	"
958 "	7,66 "	30 x 40	4 ϕ 16	"
786 "	6,29 "	30 x 30	4 ϕ 16	"
857 "	6,86 "	30 x 30	4 ϕ 16	"
959 "	7,67 "	30 x 40	4 ϕ 16	"
807 "	6,46 "	30 x 40	4 ϕ 16	"
612 "	4,90 "	30 x 30	4 ϕ 16	"
871 "	6,97 "	30 x 40 = 1200 cm^2	4 ϕ 16	"
1106 "	8,85 "	30 x 40	6 ϕ 16 = 12,06 cm^2	"
1106 "	8,85 "	30 x 40	6 ϕ 16	"
12 1107 "	8,86 "	30 x 50	6 ϕ 16	"
13 1158 "	9,26 "	30 x 50	6 ϕ 16	"
1041 "	8,33 "	30 x 40	6 ϕ 16	"
1035 "	8,28 "	30 x 40	6 ϕ 16	"
903 "	7,23 "	30 x 40	4 ϕ 16	"
619 "	4,95 "	30 x 30	4 ϕ 16	"
901 "	7,21 "	30 x 40	4 ϕ 16	"
1036 "	8,29 "	30 x 40	6 ϕ 16	"
621 "	4,97 "	30 x 30	4 ϕ 16	"
644 "	5,15 "	30 x 30	4 ϕ 16	"
959 "	7,67 "	30 x 40	6 ϕ 16	"
808 "	6,46 "	30 x 40	4 ϕ 16	"
612 "	4,90 "	30 x 30	4 ϕ 16	"
473 "	3,79 "	30 x 30	4 ϕ 16	"
473 "	3,79 "	30 x 30	4 ϕ 16	"



PILASTRI PIANO SECONDO (SALTO A QUOTA = 8,97)

A_{ci}	$A_f = 0,8 \frac{1}{10} A_{ci}$	A_R	$A_{fr} \geq 0,3 \frac{1}{10} A_R$	STAFFE
402 cm ²	3,21 cm ²	30 x 30 = 900 cm ²	4 φ 16 = 8,04 cm ²	φ 8 / 24"
600 "	4,80 "	"	"	"
700 "	5,60 "	"	"	"
580 "	4,64 "	"	"	"
633 "	5,06 "	"	"	"
701 "	5,61 "	"	"	"
590 "	4,72 "	"	"	"
444 "	3,55 "	"	"	"
636 "	5,09 "	"	"	"
819 "	6,55 "	"	"	"
41 819 "	6,55 "	"	"	"
792 "	6,34 "	"	"	"
830 "	6,64 "	"	"	"
2 771 "	6,17 "	"	"	"
6 766 "	6,13 "	"	"	"
660 "	5,28 "	"	"	"
450 "	3,60 "	"	"	"
18 658 "	5,26 "	"	"	"
19 758 "	6,06 "	"	"	"
451 "	3,61 "	"	"	"
468 "	3,75 "	"	"	"
701 "	5,61 "	"	"	"
590 "	4,72 "	"	"	"
444 "	3,55 "	"	"	"
325 "	2,60 "	"	"	"
325 "	2,60 "	"	"	"

PILASTRI PIANO FERZO (SALDO & QUOTA + 12,01) E PIANO QUARTO (SALDO & + 15,35)

	Aci	A _f = 0,8% Aci	A _R	A _{fR} ≥ 0,3% A _R	STACCA
1	251 cm ²	2,00 cm ²	30 x 30 = 900 cm ²	4φ12 = 4,52 cm ²	φ 8 / 18"
2	378 "	3,02 "	"	"	"
3	442 "	3,54 "	"	"	"
4	375 "	3,00 "	"	"	"
5	409 "	3,27 "	"	"	"
6	444 "	3,55 "	"	"	"
7	373 "	2,98 "	"	"	"
8	278 "	2,22 "	"	"	"
9	401 "	3,21 "	"	"	"
10	532 "	4,26 "	"	"	"
11	532 "	4,26 "	"	"	"
12	477 "	3,82 "	"	"	"
13	502 "	4,02 "	"	"	"
14	501 "	4,01 "	"	"	"
15	498 "	3,98 "	"	"	"
16	417 "	3,34 "	"	"	"
17	280 "	2,24 "	"	"	"
18	416 "	3,33 "	"	"	"
19	480 "	3,84 "	"	"	"
20	282 "	2,26 "	"	"	"
21	292 "	2,34 "	"	"	"
22	444 "	3,55 "	"	"	"
23	373 "	2,98 "	"	"	"
24	278 "	2,22 "	"	"	"
4	470 "	3,72 "	"	"	"
5	478 "	3,82 "	"	"	"



Rinaldo Costantino