IL DIRETTORE DEI LAVORI

S.T.P.I.	Redatto Ing. A. MALDARI			717/1
Studio tec. prof. ingegneria BRINDISI via Palestro 42 tel. 26836	GESTIONE CASE LAVORATORI			Data: 12-7-1971 Agg:
	COSTRUZIONE CASE PER LAVORATORI IN FASANO (BR) Impresa geom. RENATO MARIANO - Brindisi			
	RELAZIONE DI CALCOLO PALAZZ.	F	Rapp.	

Analisi dei carichi sui solai

Palazz. 7

Analoga a quella fatta per il Fab. 9 – Anche l'incidenza delle travi di copertura è presa uguale per i due fabbricati.

(a) **Solaio al piano di calpestio:** 730 kg/mq

(b) **Solaio al piano di copertura:** 835 kg/mq

Analisi dei carichi sulle travi

Travi: (1-2); (2-3); (3-4)

(a) **del 1° e del 2° ordine**

- Solaio + intonaco: [730 · (0,80 + 0,33) · 1,00] = 985 kg/ml
- Muratura di tamponamento: 7,5 (uguale a quella del Fab. B) = 1443 "
- Peso proprio trave (ipotizzato) = 400 "

→ 4128 kg/ml

(b) **del 3° ordine**

- Solaio + intonaco: [835 · 3,13 · 1,00] = 2614 kg/ml
- Soletta in calcestruzzo + tavellone inclinato + solaio in calcestruzzo armato (uguale al Fab. B) = 758 "
- Peso proprio = 400 "

→ 3772 kg/ml

Travi: (1-8); (4-5)

ⓐ del 1° e 2° ordine

/ Muratura di tamponamento: p.p.	= 1443 kg/ml
/ Peso proprio (ipotizzato):	= 400 "
	→ 1843 kg/ml

ⓑ del 3° ordine

/ Pavimento + tavellone + solaio	= 758 kg/ml
/ Peso proprio	= 400 "
	→ 1158 kg/ml

Trave: (5-6)

ⓐ del 1° e 2° ordine

/ Solaio + ecc: [730 · 2,80 · 1,00]	= 2044 kg/ml
/ Tramezzo che insiste direttamente (2,00 · 3,11 · 196)	= 392 "
/ p.p. trave	= 400 "
	→ 2836 kg/ml

ⓑ del 3° ordine

/ Solaio + ecc: [835 · 2,80 · 1,00]	= 2338 kg/ml
/ p.p. trave	= 400 "
	→ 2738 kg/ml

Travi: (5-11)

ⓐ del 1° e 2° ordine

Tratto 8-11

/ Solaio + ecc: [730 · (2,30 + 0,33) · 1,00]	= 1990 kg/ml
/ Muratura di tamponamento:	= 1443 "
/ p.p. trave	= 400 "
	→ 3763 kg/ml =

Trave (5-7)

/ Solaio + ecc.: [730 · 1,40 · 1,00] = 1092 kg/ml

/ Sbalzo: [650 · 2,00 · 1,00] (solaio) = 1300 "

[150 · 2,00 · 1,00] [sovraccarico (250 sono già messi in conto)] = 300 "

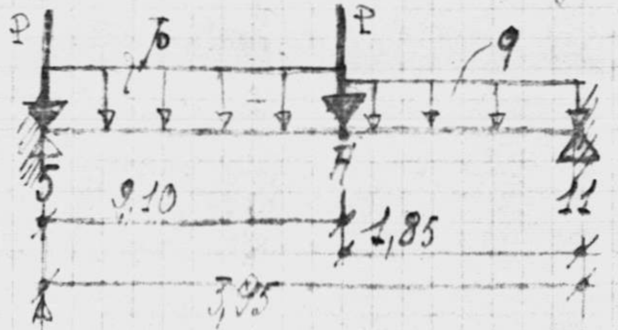
/ P. P. trave = 400 "

/ Muratura di tamponamento = 1443 "

Carico concentrato: P = 1443 · 1,1 = 1600 kg

→ 4465 kg/ml = p

Schema statico



Reazioni: 5 = [illegible] kg; 11 = 8937 kg

(b) del 3° ordine

/ Solaio + ecc.: [835 · (2,30 + 0,33) · 1,00] = 2238 kg/ml

/ Parapetto + tavellone + sbalzo = 758 "

/ Peso proprio = 400 "

→ 3396 kg/ml

Travi: (11-12)

(a) del 1° e 2° ordine

/ Solaio + ecc.: [730 · (2,30 + 0,33) · 1,00] = 1956 kg/ml

/ Muratura di tamponamento = 1443 "

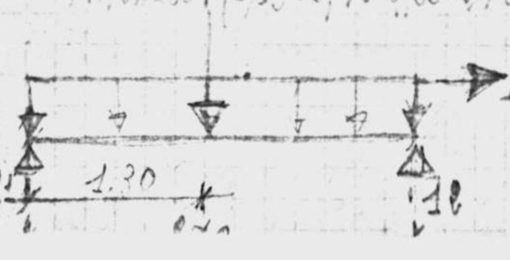
/ P. P. trave = 400 "

/ Muro divisorio:

tufo: (0,20 · 3,10 · 2,33 · 1600) = 2311

intonaco: (0,03 · 3,10 · 2,33 · 2100) = 195

→ 3799 kg/ml



P = 2506 Kg

Reazioni: 11 = 7100 kg; 12 = 5366 kg

(b) del 3° ordine

/ Solaio + ecc: [8,35 · (2,30 + 0,33) · 1,00] = 2938 kg/ml
/ Tamponato + tavellone + soletta = 758 "
/ P.P. trave = 400 "

→ 3396 kg/ml

Travi: (12-17); (18-23)

(a) del 1° e 2° ordine

/ Solaio + ecc: [7,30 · (2,30 + 0,33) · 1,00] = 1956 kg/ml
/ Muratura di tamponamento = 1443 "
/ P.P. trave = 400 "

→ 3799 kg/ml

(b) del 3° ordine

/ Solaio + ecc: [3,55 · 2,63 · 1,00] = 2938 kg/ml
/ Tamponato + tavellone + soletta = 758 "
/ P.P. trave = 400 "

→ 3396 kg/ml

Travi: (17-18)

(a) del 1° e 2° ordine

/ Solaio + ecc: [7,30 · 1,43 · 1,00] = 1044 kg/ml
/ Muratura di tamponamento = 1443 "
/ Solaio: solaio: (6,50 · 2,00 · 1,00) = 1300
scarico: (1,50 · 2,00 · 1,00) = 300
= 1600 "
/ P.P. trave = 400 "

→ 4487 kg/ml

(b) <u>del 3° ordine</u>

/ Solaio + ecc.: 335 × 6,68 · 1,00 = 2238 kg/ml
/ Parapetto + tavellone + sbalzo = 758 "
/ p.p. trave = 400 "

→ 3396 kg/ml

Travi: [redacted] (6-10)

(a) <u>del 1° e 2° ordine</u>

/ Solaio + ecc.: (730 · 2,30 · 1,00) = 1680 kg/ml
/ Tramezzo che insiste direttamente: (1,00 · 3,11 · 1,96) = 399 "
/ p.p. trave = 400 "

→ 2472 kg/ml

(b) <u>del 3° ordine</u>

/ Solaio + ecc.: (835 · 2,30 · 1,00) = 1921 kg/ml
/ p.p. trave = 400 "

→ 2321 kg/ml

Travi: (10-13)

(a) <u>del 1° e 2° ordine</u>

/ Solaio + ecc.: (730 · 2,30 · 1,00) = 1680 kg/ml
/ Muratura: tufo: (0,20 · 3,10 · 1,00 · 1600) = 992
intonaco: (0,03 · 3,10 · 1,00 · 2100) = 195 = 1187 "
/ Peso proprio = 400 "

/ Muro divisorio: → P = 2506 kg → 3267 kg/ml

(b) <u>del 3° ordine</u>

/ Solaio + ecc.: (835 · 2,30 · 1,00) = 1921 kg/ml
/ Peso proprio = 400 "

→ 2321 kg/ml

Travi: (13-16); (16-19); (19-22)

(a) del 1° e 2° ordine

- Solaio-ecc: (730 · 2,30 · 1,00) = 1680 ; (730 · 2,57 · 1,00) = 1876 — = 3556 kg/ml
- Tramezzi che insistono direttamente (1,00 · 3,11 · 1,96) — = 399 "
- P.P. travi — = 400 "

→ 4348 kg/ml

(b) del 3° ordine

- Solaio-ecc: (835 · 2,30 · 1,00) = 1921 ; (835 · 2,57 · 1,00) = 2146 — = 4067 kg/ml
- P.P. travi — = 400 "

→ 4467 kg/ml

Travi: (15-20); (20-21)

(a) del 1° e 2° ordine

- Solaio-ecc: [730 · (2,57 + 0,73) · 1,00] — = 2211 kg/ml
- Muratura di tamponamento: — = 1413 "
- P.P. — = 400 "

→ 3960 kg/ml

(b) del 3° ordine

- Solaio-ecc: [835 · 2,90 · 1,00] — = 2422 kg/ml
- P.P. — = 400 "

→ 2822 kg/ml

Travi: (14-15)

(a) del 1° e 2° ordine

- Solaio-ecc: [730 · (2,57 - 0,20) · 1,00] — = 1730 kg/ml
- Tetto: solaio (650 · 2,10 · 1,00) = 1365 ; sottraccio (150 · 2,10 · 1,00) = 315 — = 1680 "
- Muratura di tamponamento — = 1413 "

/ p.p. trave = 400 "

→ 4623 kg/ml

(b) del 3° ordine

/ Solaio + acc: [835 · 2,90 · 1,00] = 2422 kg/ml

/ p.p. = 400 "

→ 2822 kg/ml

Travi: (6-7); (7-8)

(a) del 1° e 2° ordine

/ Solaio + acc. { (730 · 2,80 · 1,00) = 2044 kg/ml ; (730 · 1,98 · 1,00) = 1445 kg/ml } = 3489 kg/ml

/ Tramezzi che insistono direttamente: (100 · 3,11 · 1,26) = 392 "

/ p.p. travi = 400 "

→ 4281 kg/ml

(b) del 3° ordine

/ Solaio + acc. { (835 · 2,80 · 1,00) = 2338 ; (835 · 1,98 · 1,00) = 1653 } = 3991 kg/ml

/ p.p. travi = 400 "

→ 4391 kg/ml

Trave a sbalzo dal pilastro 8

(a) del 1° e 2° ordine

Tratto (8-7):

/ Muratura di tamponamento = 1483 kg/ml

/ p.p. travi = 400 "

→ 1883 kg/ml

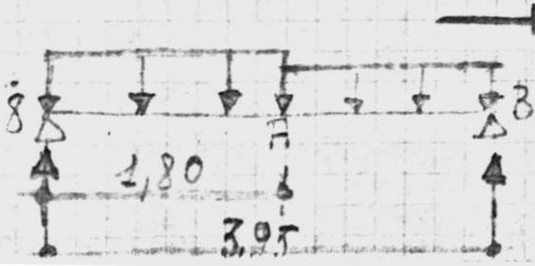
Tratto (7-8):

/ Sbalzo { solaio: (650 · 0,90 · 1,00) = 585 ; sovraccarico: (150 · 0,90 · 1,00) = 135 } = 720 kg/ml

/ p.p. = 400 "

→ 1120 kg/ml

Schema statico:



Reazioni: { 8 = 3950 kg ; B = 4587 kg }

(b) del 3° ordine

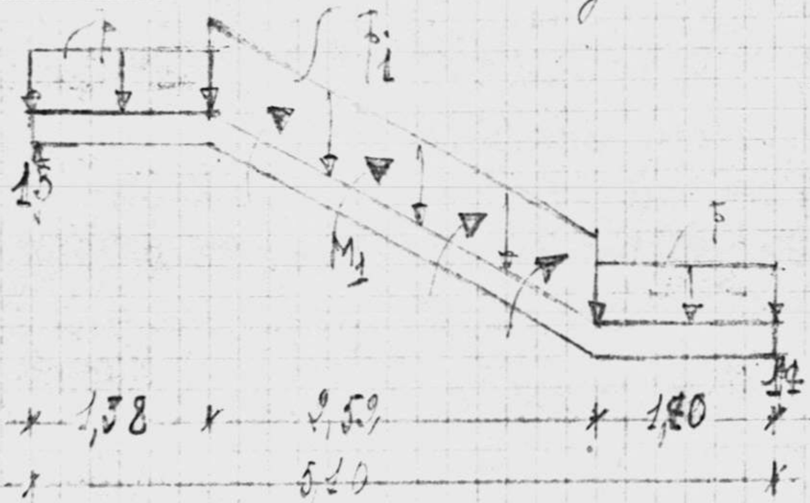
/ [illegible]

/ [illegible]

= 758 kg/ml
= 400 "
→ 1158 kg/ml

Reazioni: { 8 = 2600 kg ; A = 2600 kg }

Travi: (13-14)

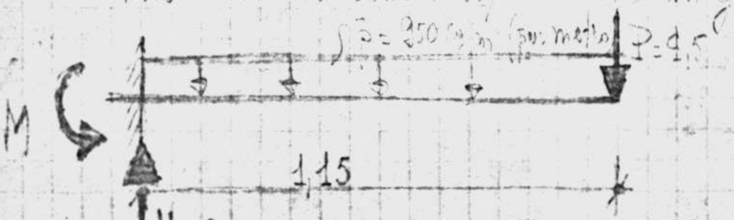


L'analisi dei carichi riguarda quella fatta per il Tab. B -

/ Muratura di tamponamento = 1200 kg/ml

/ Gradini a sbalzo + soletta:

dall'analisi dei carichi riferita ad un gradino abbiamo:

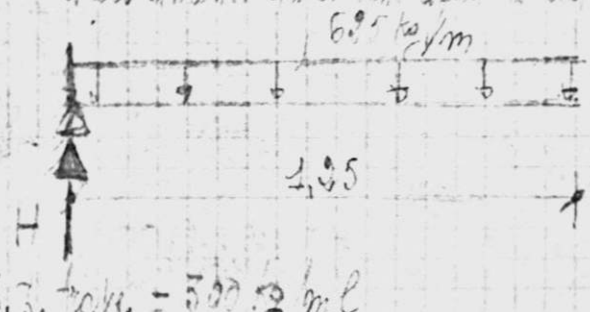


$H_{\text{metro di trave}} = 4{,}5 + 950 \cdot 1{,}15 = 1097$ kg/ml

$M_{\text{metro di trave}} = 4{,}5 \cdot 1{,}15 + 950 \cdot \frac{1{,}15^2}{2} = 639$ kgm/m

/ Peso ripiano

dall'analisi dei carichi riferita ad un metro abbiamo:



Hm. di trave = 625 · 1,25 = 781 kg/ml

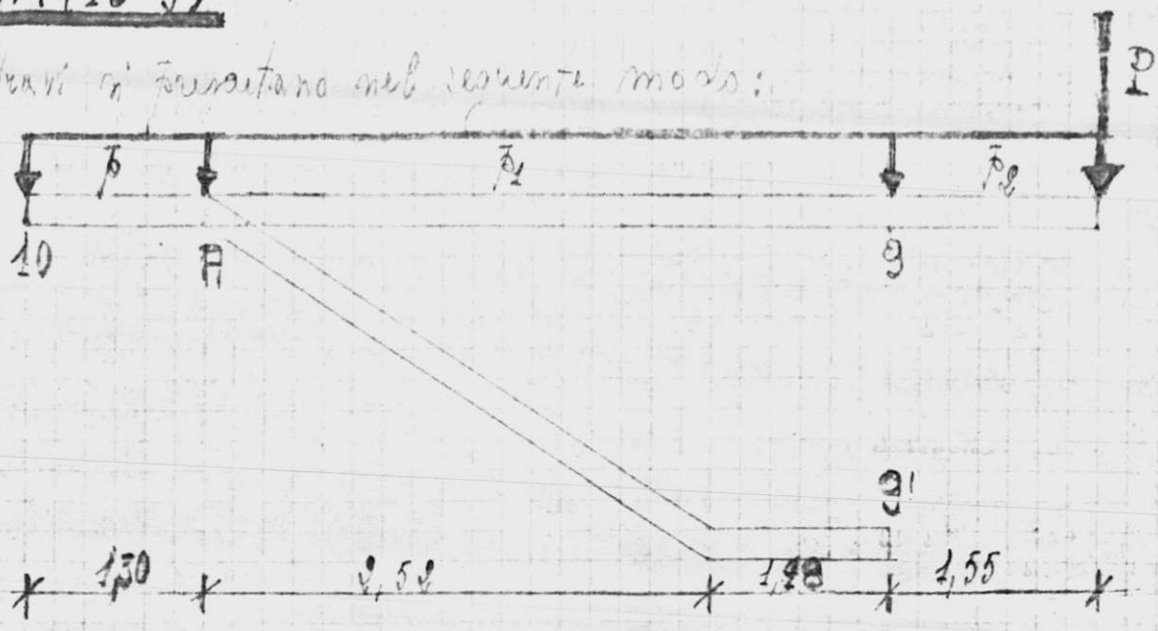
/ p.p. trave = 500 kg/ml

Carico totale → { p_1 = 2597 kg/m in corrispondenza dei gradini ; M_1 = 632 kgm/m } → { p = 2281 kg/m in corrispondenza dei ripiani }

Reazioni: 13 = 14 = 6442 kg

Travi: (10-9)

Tali travi si presentano nel seguente modo:



(1) Considerando gli assi delle travi: (10-9) orizzontale e (10-9') a ginocchio e considerando i carichi relativi alle due travi:

(a) del 1° e 2° ordine

- Solaio + ecc: (7,30 · 1,93 · 1,00) = 14,05 kg/ml
- Muratura di tamponamento = 1200 kg/ml
- Carico derivante dal tiranno nel tratto (10-A) = 9681 kg/ml
- p. p. trave = 400 kg/ml

Carico totale sui vari tratti:
- tratto (10-A): p = 5329 kg/ml
- tratto (A-9): p1 = 3015 kg/ml

Reazioni: 10 = 10300 kg; 9 = 8000 kg

(b) del 3° ordine

- Solaio + ecc: (8,35 · 1,93 · 1,00) = 16,10 kg/ml
- Muratura di tamponamento: (3,60 · 1,00 · 0,30 · 1600) = 800 kg/ml
- p. p. trave = 400 kg/ml

Carico totale (uguale per i due tratti) → p = p1 = 1810 kg/ml

(20) Tratto a sbalzo dal pilastro 9

(a) del 1° e 2° ordine

/ Terrazzo: { solaio + ecc.: (730 · 1,98 · 1,00) = 1445 kg/ml
{ sovraccarico: (150 · 1,98 · 1,00) = 297 kg/ml
/ p.p. trave = 400 "

→ 2142 kg/ml = p_2

/ Carico concentrato derivante dalla trave a sbalzo dal pilastro 8 = P = 2527 kg ←

(b) del 3° ordine

/ Solaio: (835 · 1,98 · 1,00) = 1654 kg/ml
/ Parapetto + tavellone + sbalzo = 758 "
/ p.p. trave = 400 "

→ 2812 kg/ml = p_3

/ Carico concentrato derivante dalla trave a sbalzo dal pilastro 8 = P = 2600 kg ←

Travi: (21-22); (22-23)

(a) del 1° e 2° ordine

/ Muratura di tamponamento nel tratto (21-A) = 1483 kg/ml
/ Muratura di tamponamento nei tratti: (A-22); (22-23)

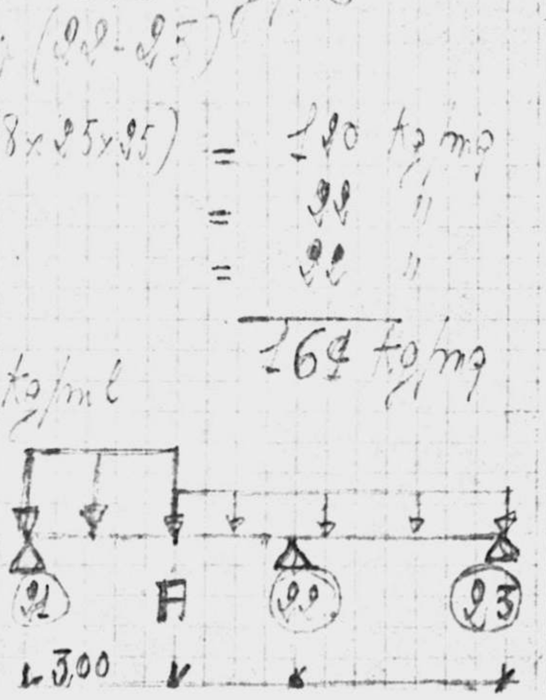
(RDB - tipo 19) - doppio tavolato di laterizi forati (8x25x25) = 120 kg/mq
- intonaco grezzo: (0,015 · 1500) = 22 "
- intonaco interno: (0,015 · 1500) = 22 "

164 kg/mq

Peso totale al ml: (1,00 · 3,11) · 164 = 510 kg/ml

/ p.p. trave = 400 kg/ml

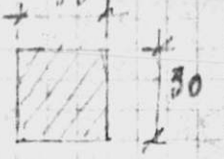
Carico totale { Tratto (21-A) = 1883 kg/ml
→ { Tratto (A-22)-(22-23) = 910 kg/ml



Pilastro 3

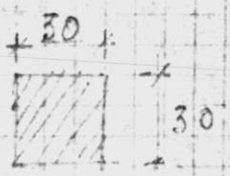
ⓐ 3° ordine

trave (3-2) :	= 9739 kg
trave (3-4) : (2,30 · 577)	= 3675 "
p.p.	= 680 "
	→ 19087 kg



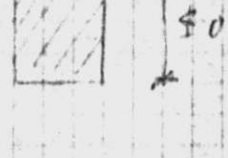
ⓑ 2° ordine

peso sovrastante	= 19087 kg
trave (3-2) :	= 10603 "
trave (3-4) : (2,30 · 1193)	= 7494 "
p. p.	= 680 "
	→ 39870 kg



ⓒ 1° ordine p. p.

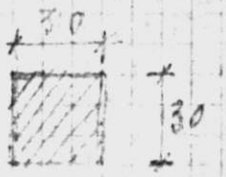
peso sovrastante	= 39870 kg
trave: (3-2) + (3-4)	= 20103 "
p. p. relativa: (2,30 + 2,57) · 176	= 850 "
	→ 61723 kg



Pilastro 1

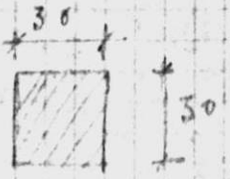
ⓐ 3° ordine

trave (1-3)	= 8575 kg
trave (1-5)	= 3922 "
p. p.	= 680 "
	→ 12597 kg



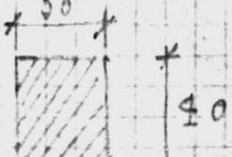
ⓑ 2° ordine

peso sovrastante	= 12597 kg
trave (1-3)	= 9494 "
trave (1-5)	= 5160 "
p. p.	= 680 "
	→ 27931 kg



ⓒ 1° ordine p. p.

peso sovrastante:	= 27931 kg
trave (1-3) + (1-5)	= 14654 "
p. p. relativa: (2,30 + 2,30) · 176	= 900 "
	→ 43485 kg

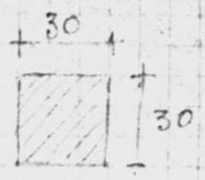


Analisi dei carichi sui pilastri

Pilastro 1

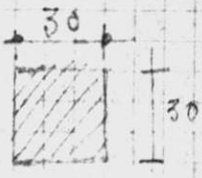
ⓐ 3° ordine

trave (1-2) : (0,83 · 3772)	= 3130	kg
trave (1-8) : (2,80 · 1158)	= 3242	"
p. p. : (3,00 · 0,30 · 0,30 · 2500)	= 680	"
	→ 7052	kg



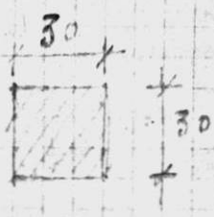
ⓑ 2° ordine

peso sovrastante	= 7052	kg
trave (1-2) : (0,83 · 4193)	= 3496	"
trave (1-8) : (2,80 · 1843)	= 5160	"
p. p.	= 680	"
	→ 16318	kg



ⓒ 1° ordine

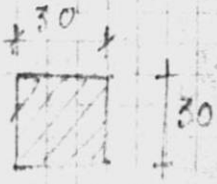
peso sovrastante	= 16318	kg
travi [(1-2) + (1-8)]	= 8586	"
p. p.	= 680	"
p. p. vetta [(2,80 + 0,80) · 0,08 · 0,88] · 2500	= 670	"
	→ 26254	kg



Pilastro 2

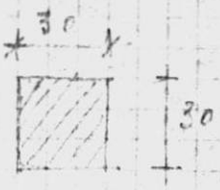
ⓐ 3° ordine

trave (2-1) :	= 3130	kg
trave (2-5) : (2,57 · 3772)	= 9739	"
p. p.	= 680	"
	→ 13549	kg



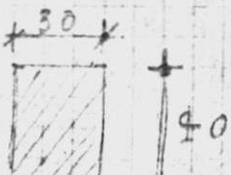
ⓑ 2° ordine

peso sovrastante	= 13549	kg
trave (2-1) :	= 3496	"
trave (2-5) + (2,57 · 4193)	= 10609	"
p. p.	= 680	
	→ 28257	kg



ⓒ 1° ordine

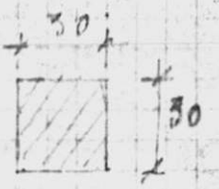
peso sovrastante	= 28257	kg
trave (2-1) + (2-5)	= 14035	"
p. p. (0,30 · 2,50 · 3,00 · 2500)	= 900	"
p. p. vetta (2,57 + 0,80) · 176	= 450	"
	→ 43642	kg



Pilastro 3

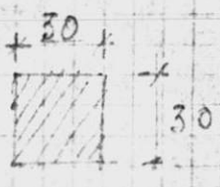
ⓐ 3° ordine

trave (3-2) : = 9739 kg
trave (3-4) : (2,30 · 5775) = 8675 "
f.s. = 680 "
→ 19087 kg



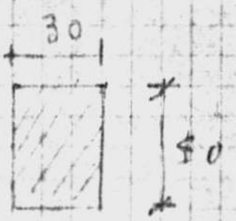
ⓑ 2° ordine

peso sovrastante = 19087 kg
trave (3-2) : = 10603 "
trave (3-4) : (2,30 · 4198) = 9654 "
f.s. = 680 "
→ 39870 kg



ⓒ 1° ordine s.s.

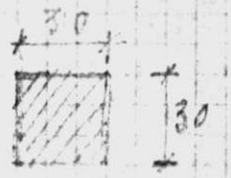
peso sovrastante = 39870 kg
trave: (3-2) + (3-4) = 20103 "
f.s. ridotta: (2,30 + 2,57) · 176 = 850 "
→ 61723 kg



Pilastro 4

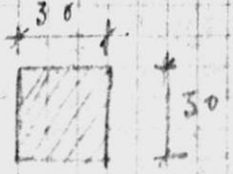
ⓐ 3° ordine

trave (4-3) = 8575 kg
trave (4-5) = 3992 "
f.s. = 680 "
→ 13247 kg



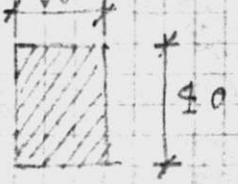
ⓑ 2° ordine

peso sovrastante = 13247 kg
trave (4-3) = 9494 "
trave (4-5) = 5160 "
f.s. = 680 "
→ 28581 kg



ⓒ 1° ordine s.s.

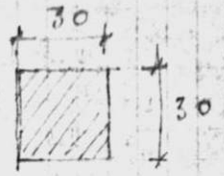
peso sovrastante: = 28581 kg
trave (4-3) + (4-5) = 14654 "
f.s. ridotta: (2,30 + 2,30) · 176 = 900 "
→ 44135 kg



Pilastro 5

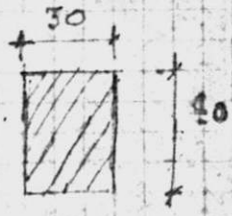
a 3° ordine

trave (5-9)	= 3992 kg
trave (5-6): (9738 · 1,30)	= 6997 "
trave (5-11): (3396 · 1,97)	= 6690 "
p.p.	= 680 "
	→ 16909 kg



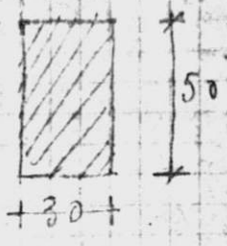
b 2° ordine

peso sovrastante	= 16909 kg
trave (5-9)	= 5160 "
trave (5-6): (2,30 · 2836)	= 6523 "
trave (5-11): carico concentrato	= 1600 "
reazione	= 9000 "
p.p.	= 900 "
	→ 40092 kg



c 1° ordine

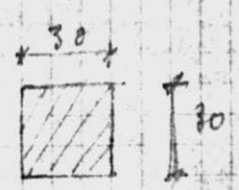
p.p. relAa: (2,80+1,97) · 176	= 840 "
peso sovrastante	= 40092 "
trave (5-9)+(5-6)+(5-11)	= 22953 "
p.p. (0,30·0,50·300·2500)	= 1125 "
	→ 64340 kg



Pilastro 6

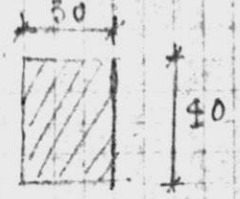
a 3° ordine

trave (6-5)	= 6997 kg
trave (6-10): (2391 · 1,97)	= 4572 "
trave (6-7): (2391 · 2,57)	= 11148 "
p.p.	= 680 "
	→ 23677 kg



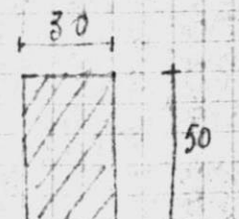
b 2° ordine

trave (6-5)	= 6593 kg
trave (5-10): (2478 · 1,97)	= 4870 "
trave (6-7): (7781 · 2,57)	= 12009 "
peso sovrastante	= 23677 "
p.p.	900 "
	→ 45979 kg



c 1° ordine

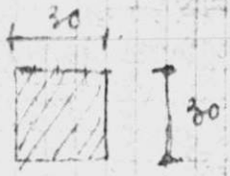
peso sovrastante	= 45979 kg
trave (6-5)+(6-10)+(6-7)	= 23595 "
p.p.	= 1125 "
	→ 69699 kg



Pilastro 7

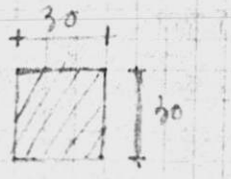
ⓐ del 3° ordine

trave (7-6) : = 11128 kg
trave (7-8) : (4391 · 0,83) = 3645 "
p. p. = 680 "
→ 15453 kg



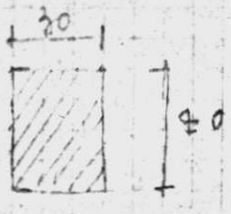
ⓑ del 2° ordine

peso sovrastante = 15.453 kg
trave (7-6) : = 11.000 "
trave (7-8) : (4481 · 0,53) = 3553 "
p. p. = 680 "
→ 30688 kg



ⓒ del 1° ordine s. s.

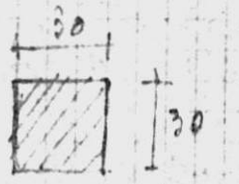
peso sovrastante 900 "
trave: (7-6) + (7-8) = 30688 "
p. p. vela Ha : (1,97+0,82) · 176 = 14555 "
→ 46633 kg = 490 "



Pilastro 8

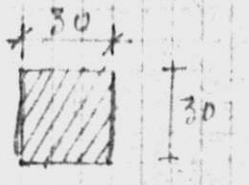
ⓐ del 3° ordine

trave (8-1) = 3919 kg
trave (8-7) = 3553 "
trave asfalto = 2600 "
p. p. = 680 "
→ 10752 kg



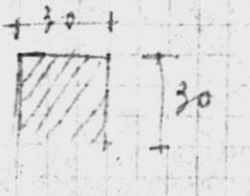
ⓑ del 2° ordine

peso sovrastante = 10752 kg
trave (8-1) = 5160 "
trave (8-7) = 3553 "
trave asfalto = 3250 "
p. p. = 680 "
→ 23718 kg



ⓒ del 1° ordine s. s.

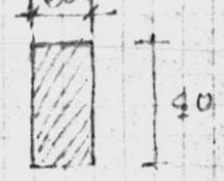
688 kg
peso sovrastante = 23718 "
trave: (8-1) + (8-7) + (asfalto) = 11963 "
p. p. vela Ha : (2,80+0,83) · 176 = 630 "
→ 35991 kg



Pilastro 9

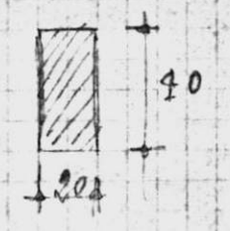
ⓐ 3° ordine

trave a sbalzo { carico concentrato (9812 · 1,55) = 9600 kg
trave (9-10): (9840 · 2,57) = 2358 "
p.p. (0,30 · 0,50 · 3,00 · 2500) = 7300 "
= 600 "
→ 19858 kg

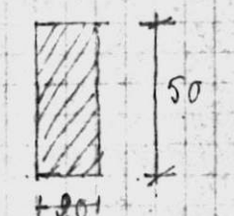


ⓑ 2° ordine

trave a sbalzo { carico concentrato (9812 · 1,55) = 9812 kg
= 3310 "
trave (9-10): = 8000 "
peso sovrastante = 19858 "
p.p. = 3600 "
→ 39325



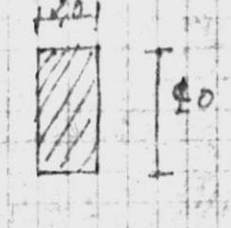
ⓒ 1° ordine p.f.
trave a sbalzo + trave (9-10) = 750 kg
peso sovrastante = 13867 "
p.f. velitta: (1,97 + 1,85) · 176 = 39325 "
= 670 "
→ 54612



Pilastro 10

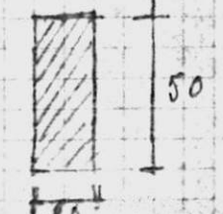
ⓐ 3° ordine

trave (10-9): = 7300 kg
trave (10-6): = 4572 "
trave (10-13): (9321 · 1,35) = 3133 "
p.f.p. = 600 "
→ 15605 kg



ⓑ 2° ordine

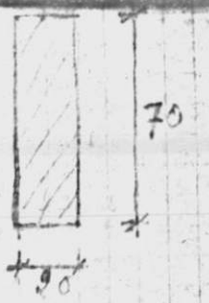
trave (10-9) = 10300 kg
trave (10-6) = 4572 "
trave (10-13) { (3967 · 1,35) = 4410 "
carico concentrato = 1253 "
peso sovrastante = 15605 "
p.f. = 750 "
→ 37188 kg



ⓒ 1° ordine

ⓒ 1° ordine

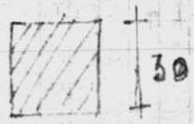
travi: (10-9) + (10-6) + (10-13)	= 20555 kg
peso sovrastante	= 37183 "
p. p. (0,30 · 0,70 · 3,00 · 2500)	= 1050 "
	→ 59071 kg



Pilastro 11

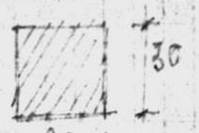
ⓐ 3° ordine

trave (11-5)	= 6690 kg
trave (11-12): (3396 · 1,35)	= 4584 "
p. p.	= 680 "
	→ 11954 kg



ⓑ 2° ordine

trave (11-5)	= 8937 kg
trave (11-12):	= 7400 "
peso sovrastante	= 11954 "
p. p.	= 680 "
	→ 28971 kg



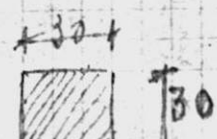
ⓒ 1° ordine p. p.

trave: (11-5) + (11-12)	900 kg
peso sovrastante	= 16337 "
p. p. vetta: (1,27 + 1,85) · 176	= 28971 "
	= 670 "
	→ 46878 kg

Pilastro 12

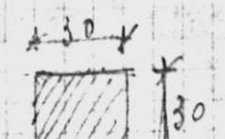
ⓐ 3° ordine

trave (12-11)	= 4584 kg
trave (12-17): (3396 · 1,50)	= 5094 "
p. p.	= 680 "
	→ 10358 kg



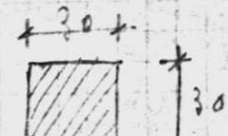
ⓑ 2° ordine

trave (12-11)	= 5366 kg
trave (12-17): (3799 · 1,50)	= 5698 "
p. p.	= 680 "
peso sovrastante	= 10358 "
	→ 22102 kg



ⓒ 1° ordine p. p.

travi: (12-11) + (12-17)	680 kg
p. p. vetta: (1,50 + 1,35) · 176	= 11064 "
peso sovrastante	= 500 "
	= 22102 "
	→ 34346 kg



Pilastro 13

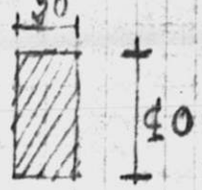
3° ordine p. p.

trave (13-10)

trave (13-16): (1,50 · 4467)

trave (13-14):

= 600
= 3133 kg
= 6700 "
= 6442 "
→ 17055 kg

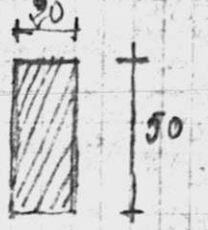


2° ordine p. p.

peso sovrastante = 17055 kg
680
= 17735 kg

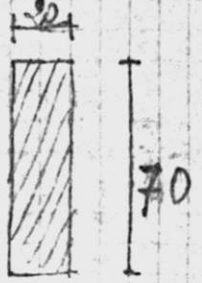
trave (13-10) { carico distribuito = 4410 "
carico concentrato = 1953 "

trave (13-16): (4348 · 1,50) = 6522 "
trave (13-14) = 6442 "
→ 36362 kg



1° ordine

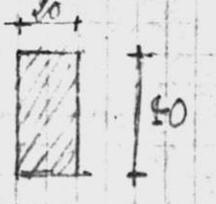
peso sovrastante = 36362 kg
trave [(13-10) + (13-16) + (13-14)] = 18627 "
p. p. = 900 "
→ 55889 kg



Pilastro 14

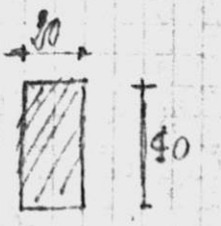
3° ordine

trave (14-13) = 6442 kg
trave (14-15): (9522 · 1,50) = 14283 "
p. p. = 680 "
→ 11355 kg



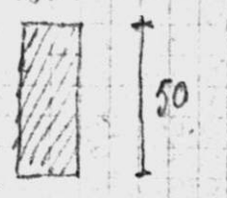
2° ordine

peso sovrastante = 11355 kg
trave (14-13) = 6442 "
trave (14-15): (4643 · 1,50) = 6964 "
p. p. = 680 "
→ 25441 kg



3° ordine p. p.

peso sovrastante = 680 "
= 25441 "
trave: [(14-13) + (14-15)] = 13406 "
p. p. vetta: (1,50+1,35) · 176 = 500
→ 40027 kg



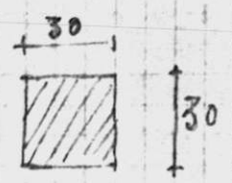
Pilastro 15

3° ordine

trave (15-14) = 4433 kg
trave (15-20) : (2822 · 1,50) = 4233 "
f.f. = 680 "
→ 9146 kg

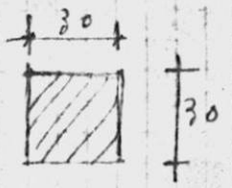
2° ordine

trave (15-14) = 6964 kg
trave (15-20) : (3960 · 1,50) = 5940 "
peso sovrastante = 9146 "
f.f. = 680 "
→ 22730 kg



1° ordine f.f.

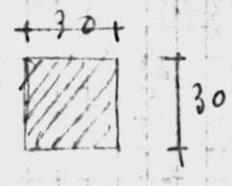
travi: [(15-14) + (15-20)] = 11904 kg
680
peso sovrastante = 22730 "
f.f. vela Ha : (3,00 · 176) = 530 "
→ 36844 kg



Pilastro 16

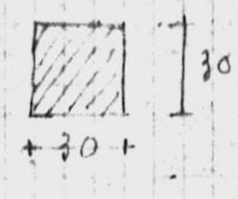
3° ordine

trave : (16-13) : (2467 · 1,50) = 6700 kg
trave : (16-19) : (2467 · 1,50) = 6700 "
f.f. = 680 "
→ 14080 kg



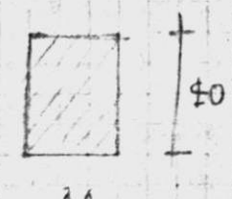
2° ordine

peso sovrastante = 14080 kg
trave : (16-13) : (2348 · 1,50) = 6522 "
trave : (16-19) = 6522 "
f.f. = 680 "
→ 27804 kg



1° ordine

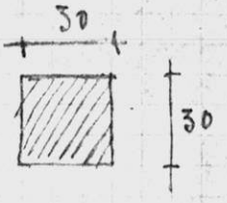
peso sovrastante = 27804 kg
travi: [(16-13) + (16-19)] = 13052 "
f.f. = 900 "
→ 41748 kg



Pilastro 17

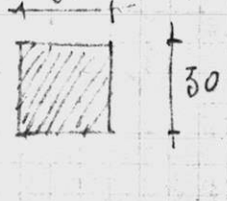
3° ordine

trave (17-12) : (3396 · 1,50) = 5094 kg
trave (17-18) : (3396 · 1,50) = 5094 "
p.p. = 680 "
→ 10868 kg



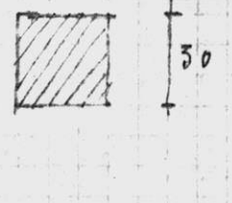
2° ordine

trave (17-12) : (3799 · 1,50) = 5698 kg
trave (17-18) : (2287 · 1,50) = 3730 "
peso sovrastante = 10868 "
p.p. = 680
→ 23976 kg



1° ordine p.p.

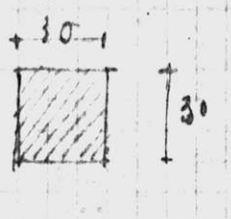
680 "
peso sovrastante = 23976 "
travi: (17-12) + (17-18) = 12988 "
p.p. veletta: (3,00 · 176) = 530 "
→ 37614



Pilastro 18

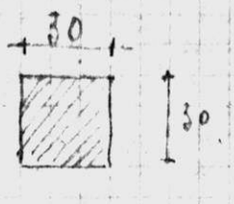
3° ordine

trave (18-17) = 5094 kg
trave (18-23) : (3396 · 1,67) = 5671 "
p.p. = 680 "
→ 11445 kg



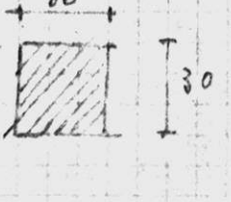
2° ordine

trave (18-17) = 6730 kg
trave (18-23) : (3800 · 1,67) = 6346 "
p.p. = 680 "
peso sovrastante = 11445 "
→ 25201 kg



1° ordine p.p.

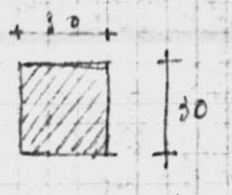
680 kg
peso sovrastante = 25201 "
trave: [(18-17) + (18-23)] = 13076 "
p.p. veletta: (1,50 + 1,67) · 176 = 560 "
→ 39517 kg



Pilastro 19

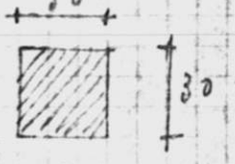
3° ordine

trave (19-16): = 6700 kg
trave (19-22): (4257 · 1,67) = 7460 "
p.p. = 680 "
→ 14840 kg



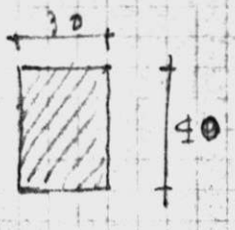
2° ordine

trave (19-16) = 6522 kg
trave (19-22): (4338 · 1,67) = 7251 "
p.p. = 680 "
peso sovrastante = 14840 "
→ 29303 kg



1° ordine

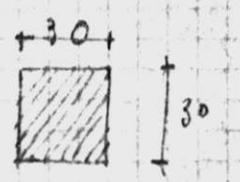
peso sovrastante = 29303 kg
travi: [(19-16) + (19-22)] = 13783 "
p.p. = 900 "
→ 43986 kg



Pilastro 20

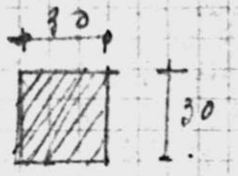
3° ordine

trave (20-15): (4333 · 1,50) = 4333 kg
trave (20-21): (4333 · 1,67) = 4713 "
p.p. = 680 "
→ 9626 kg



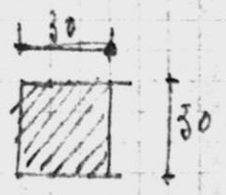
2° ordine

trave (20-15): (3960 · 1,50) = 5940 kg
trave (20-21): (3960 · 1,67) = 6613 "
p.p. = 680 "
peso sovrastante = 9626 "
→ 22859 kg



1° ordine p.p. 680 cfo

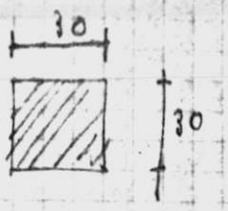
trave [(20-15) + (20-21)] = 12553 "
peso sovrastante = 22859 "
p.p. volta: (1,50 + 1,67) · 176 = 560 "
→ 36652 kg



Pilastro 21

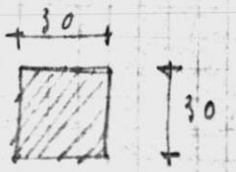
3° ordine

trave (21-20): = 2713 kg
trave (21-22): (400 · 2,57) = 1080 "
p.p. = 680
→ 6413 kg



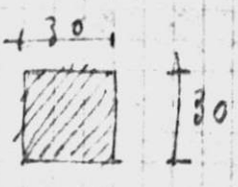
2° ordine

trave (21-20): = 6613 kg
trave (21-22): = 5300 "
p. p. = 680 "
peso sovrastante: = 6213 "
→ 19006 kg



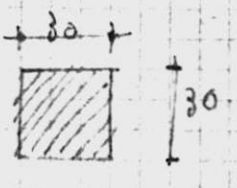
1° ordine s. s.

680 kg
peso sovrastante = 19006 "
trave: [(21-20) + (21-22)] = 11913 "
p. p. ridotta: 1,67 · 176 = 990 "
→ 31889 kg



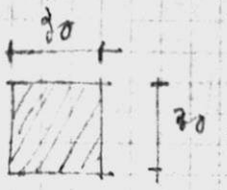
Pilastro 22

3° ordine trave (19-22): (4467 · 1,67) = 7620
trave (22-21) = 1020 kg
trave (22-23): (400 · 2,3) = 920 "
p. p. = 680 "
→ 10260 kg



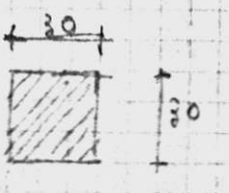
2° ordine ss,

680 kg
peso sovrastante = 10260 kg
trave (22-21): = 1300 "
trave (22-23): (910 · 2,30) = 2093 "
trave (19-22): (4345 · 1,67) = 7260 "
→ 22593 kg



1° ordine

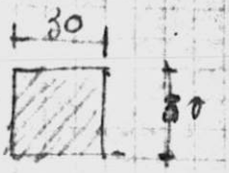
peso sovrastante = 22593 kg
trave [(22-21) + (22-23)] = 11653 "
p. p. = 680 "
→ 34926 kg



Pilastro 23

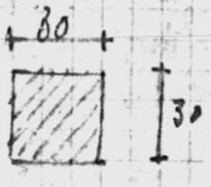
3° ordine

trave (23-22) = 990 kg
trave (23-18): = 5671 "
f.f. = 680 "
→ 7271 kg



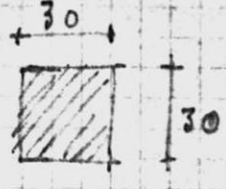
2° ordine

trave (23-22) = 990 kg
trave (23-18) = 6396 "
f.f. = 680 "
peso sovrastante = 7271 "
→ 15217 kg



1° ordine f.f.

trave: (23-22) + (23-18) = 7686 "
peso sovrastante = 15217 "
f.f. vela H: 1,67 · 176 = 290 "
→ 23453 kg



Ipotizziamo una $\sigma_t = 3{,}5$ kg/cm²

[redacted]

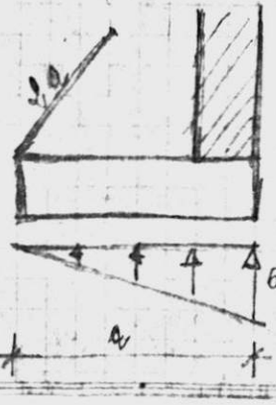
(carico alla base del pilastro)	dimensioni plinto	altezza del plinto
Pilastro: 1-[redacted] (30×30)		
P = 85.551 kg	(0,90 × 0,90)	h = 0,60 m
Pilastri: 8-12-14-15-17-18-20-21 (30×30)		
P = 32.597 kg	(1,10 × 1,10)	h = 0,60 m
Pilastri: 2-4-7-11-16-19 (30×40)		
P = 46.208 kg	(1,20 × 1,20)	h = 0,60 m
Pilastri: 3-13 (30×40)		
P = 60.373 kg	(1,40 × 1,40)	h = 0,60 m
Pilastri: 5-6 (30×50)		
P = 69.199 kg	(1,50 × 1,50)	h = 0,60 m
Pilastro: 9 (30×50)		
P = 43.920 kg	(1,10 × 1,40)	h = 0,60 m
Pilastro: 10 (30×70)		
P = 59.071 kg	(1,20 × 1,60)	h = 0,60 m

Pilastro: 22 (30×30)

Essendo il plinto sotto ipotizziamo una distribuzione triangolare delle tensioni sul terreno:

$$\left(\sigma_{t\,max} \cdot \frac{a}{2}\right) \cdot a = P = 34.926 \text{ kg}$$

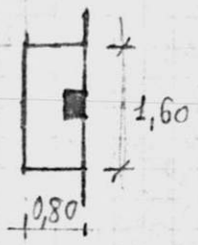
$$a = \sqrt{\frac{34.926 \text{ kg} \cdot 2 \text{ (plinto)}}{\sigma_{t\,max}}} = \sqrt{\frac{38.000}{3{,}5}} = 1{,}04 \text{ assumiamo } 1{,}10 \text{ cm}.$$



Pilastro: P3 (30 x 30)

$$\left(\sigma_{t\,max} \cdot \frac{a}{2}\right) \cdot 2a = P = 23 \div 53 \text{ kg}$$

$$a = \sqrt{\frac{23 \div 53 \text{ kg}}{3,5}} = \sqrt{\frac{15000}{3,5}} = 0,84 \quad \text{assumiamo: } a = 0,80 \text{ cm}.$$



Plinto n°	Dimensioni (m×m)	Carico al piede (Kg)	p.p. plinto (Kg)	carico sul terreno σ_t (kg/cm²)	M_1 (kgm) $\frac{P}{4}\left(\frac{A}{3}-\frac{a}{2}\right)$	σ_f/σ_c	A_{fA} (cm²)	M_2 kgm $\frac{P}{4}\left(\frac{B}{3}-\frac{b}{2}\right)$	σ_f/σ_c	A_{fB} (cm²)	$\tau_{max}/\bar{\tau}_{max}$ (kg/cm²)	A_{fpA} (cm²)	A_{fpB} (cm²)
22	(2,20×2,20)	34'926	3'993	3,22	5'820	1400/42	8,00	5090	1400/45	6,9	27.000/21,96	5,6	4,8
1-3	(0,90×0,90)	16'222	1'215	3,38	933	1400/<30	1,3						
2-12-15-17-18-20-21	(2,10×2,10)	39'517	1'815	3,21	2'133	1400/<30	2,8					2,0	
2-4-7-11-16-19	(2,20×2,20)	45'633	2'180	3,39	2'914	1400/33	3,3					2,7	
3-1	(2,10×2,10)	61'723	2'910	3,30	4'876	1400/44	6,5					4,5	
5-6	(2,50×2,50)	69'492	3'375	3,30	6080	1400/50	3,25				27'373/11,28	5,8	
9-14 (30×50)	(2,10×2,90)	44'612	2'310	3,05	(a=50) 2'966	1400/<30	3,9	(b=30) 2'409	1400/37	3,9	11'153/10,87		(b=30) 2,3
10-13 (20×70)	(2,20×2,60)	59'071	2'880	3,23	(a=70) 4'430	1400/<30	5,8	(b=20) 2'702	1400/40	3,6		(a=70) 2,10	(b=20) 2,5
23	(0,90×2,50)	23'453	2'430	3,20	2'104	1400/40	5,5	5'276	1400/18	7,1		3,9	5,00