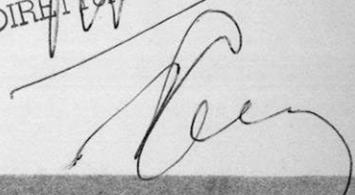


IL DIRETTORE DEI LAVORI



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

Analisi dei carichi sui solai Palazzo B

a) Solaio al piano di calpestio

- Sovraccarico accidentale	=	250	kg/m ²
- Solaio 40+8 z.p.	=	250	"
- Intonaco intubacesso = $0,015 \cdot 1500$	=	22,5	"
- Massetto di sotto fondo pavimento = $0,08 \cdot 1500$	=	120	"
- Pavimentazione = $0,03 \cdot 1200$	=	36	"
- Impasto di muriculate = $0,04 \cdot 800$	=	32	"
		650	kg/m ²
- Ingombri a tre pezzi:			
rifinitori ad un'area sufficientemente grande si usano:			
$(1,36 \cdot 3,11 \cdot 1,26) = 5300 \text{ kg}$			
$[5300 : (14,9 \cdot 5,60)] = 79 \text{ kg/m}^2$			
		80	"
		730	kg/m ²

b) Solaio al piano di copertura

- Sovraccarico accidentale	=	250	kg/m ²
- Solaio 70+5 z.p.	=	385	"
- Intonaco intubacesso = $0,015 \cdot 1500$	=	22,5	"
- Massetto di sotto fondo = $0,05 \cdot 1500$ (con sudeu = 2%)	=	75	"
- Letto di malta = $0,02 \cdot 1200$	=	24	"
- Lustricato solare = $0,03 \cdot 2000$	=	60	"
		835	kg/m ²

Analisi dei carichi sulle travi

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

a) 1° e 2° ordinarie

1 Muratura di tamponamento:

travato di calcare: $(0,13 \cdot 2000) = 260 \text{ kg/mq}$

intonaco esterno: $(0,015 \cdot 1500) = 22 \text{ "}$

(RDS tipo 1a) travato di laterizi forati: $(8 \times 95 \times 95) = 60 \text{ "}$

intonaco interno: $(0,015 \cdot 1500) = 22 \text{ "}$

564 kg/mq

= 1443 kg/ml

Carico al ml:

$(1,00 \cdot 321) \cdot 464 = 1443 \text{ kg/ml}$

1 Peso proprio

ipotizziamo un pz pari a

= 400 "

→ 1843 kg/ml

b) 3° ordinarie

1 Parete in calcare

$(0,15 \cdot 1,20 \cdot 1,00) \cdot 2000$

= 360 kg/ml

1 Tavellone inclinato con intonaco in granigliato

grigio cemento

tavellone: = 40 kg/mq

intonaco: $(0,015 \cdot 2000) = 30 \text{ "}$

70 kg/mq

Carico al ml:

$(70 \cdot 1,20 \cdot 1,00) = 84 \text{ kg/ml}$

1 Plafond in laterizio armato

solco $(30 \times 5) = 150 \text{ kg/mq}$

intonaco $(0,015 \cdot 2000) = 30 \text{ "}$

180 kg/mq

Carico al ml:

$(180 \cdot 0,75 \cdot 1,00) = 135$

1 Peso proprio

ipotizziamo un pz pari a

= 400 "

Travi: (3-4); (4-9)

Ⓐ 1° e 2° oroline

- Solai + ecc = 1740 kg/ml
- Carico al ml: $(730 \cdot 2,37 \cdot 1,00) = 1740 \text{ kg/ml}$
- Muratura di tamponamento = 1443 "
- P.P. trave = 400 "

→ 3583 kg/ml

Ⓑ 3° oroline

- Solai + ecc = 2000 kg/ml
- Carico al ml: $(835 \cdot 2,37 \cdot 1,00) = 2000 \text{ kg/ml}$
- Pavimento + Tavelle + scalgo = 758 "
- P.P. = 400 "

→ 3158 kg/ml

Travi: (9-10)

Ⓐ 1° e 2° oroline

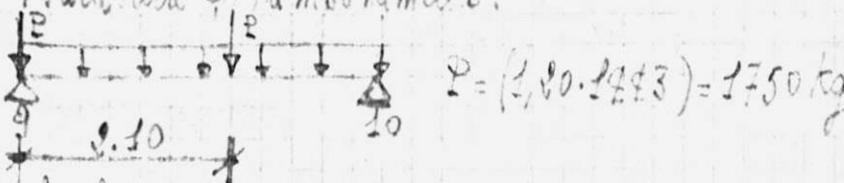
1° Trave 9-7

- Solai + ecc: $(730 \cdot 2,37 \cdot 1,00) = 1740 \text{ kg/ml}$
- Muratura di tamponamento = 1443 "
- P.P. = 400 "

→ 3583 kg/ml = 6

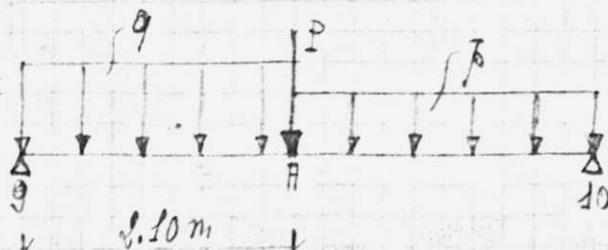
2° Trave 7-10

- Solai + ecc: $(650 \cdot (350 - 2,37) \cdot 1,00) = 730 \text{ kg/ml}$
- P.P. = 400 "
- Muratura di tamponamento: = 1443 "



- Solai: $(650 \cdot 2,70 \cdot 1,00) = 1755 \text{ kg/ml (solai)}$ = 1360 "
 - $(350 \cdot 2,70 \cdot 1,00) = 955 \text{ kg/ml (esistenze sovraccarico)}$
- 4073 kg/ml = 9

Schema statico



6) 3° ordine

- Solai + ecc: $(835 \cdot 9,37 \cdot 1,00)$
- Parapetto + tavellone + spalti
- p.p.

$$= 2000 \text{ kg/ml}$$

$$= 758 \text{ "}$$

$$= 200 \text{ "}$$

→ 3158 kg/ml

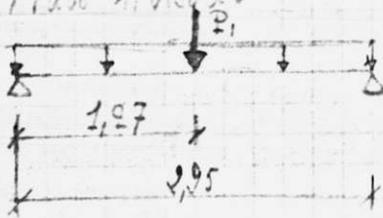
Travi: (10-15)

a) 1° e 2° ordine

- Solai + ecc: $(730 \cdot 9,37 \cdot 1,00)$
- Muratura di tamponamento
- Muro di ricambio

$$= 1740 \text{ kg/ml}$$

$$= 1443 \text{ "}$$



Schema statico

tubo: $(0,90 \cdot 3,10 \cdot 9,10 \cdot 1600) = 4400$

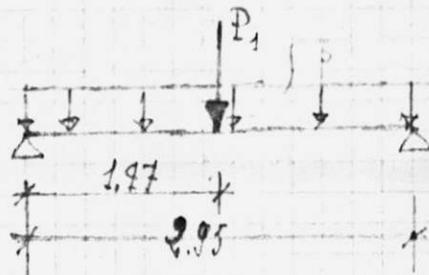
interrato: $(2,100 \cdot 2,03 \cdot 3,10 \cdot 9,10) = 180$

$P_1 = 4580 \text{ kg}$

$$= 400 \text{ "}$$

→ $3583 \text{ kg/ml} = 7$

p.p.



6) 3° ordine

- Solai + ecc: $(835 \cdot 9,37 \cdot 1,00)$
- Parapetto + tavellone + spalti
- p.p.

$$= 2000 \text{ kg/ml}$$

$$= 758 \text{ "}$$

$$= 200 \text{ "}$$

→ 3158 kg/ml

Travi: (2-5)

a) 1° e 2° ordine

- Solai (3-2): $(730 \cdot 9,37 \cdot 1,00)$
- Solai (2-1): $(730 \cdot 9,17 \cdot 1,00)$
- Tramezzo che insiste direttamente sulle travi:
 $(1,00 \cdot 3,11 \cdot 126) = 390 \text{ kg/ml}$
- p.p.

$$= 1740 \text{ kg/ml}$$

$$= 1580 \text{ "}$$

$$= 390 \text{ "}$$

$$= 400 \text{ "}$$

→ 4100 kg/ml

6) 3° ordine

- Solai (3-2): $(2,07 \cdot 1,00 \cdot 835)$
- Solai (2-1): $(2,17 \cdot 1,00 \cdot 835)$
- p.p.

$$= 1740 \text{ kg/ml}$$

$$= 1800 \text{ "}$$

$$= 200 \text{ "}$$

→ 3960 kg/ml

Travi: (5-8); (8-11)

(a) 1° e 2° ordinarie

- Solai (3-9): $(730 \cdot 2,37 \cdot 1,00)$ = 1740 kg/ml
- Solai (9-1): $(730 \cdot 2,80 \cdot 1,00)$ = 2050 "
- Tramezzo che insiste direttamente = 390 "
- P.P. = 400 "

→ 4570 kg/ml

(b) 3° ordinarie

- Solai (3-9): $(835 \cdot 2,17 \cdot 1,00)$ = 1810 kg/ml
- Solai (9-1): $(835 \cdot 2,80 \cdot 1,00)$ = 2350 "
- P.P. = 400 "

→ 4560 kg/ml

Travi: (1-1')

(a) 1° e 2° ordinarie

- Solai ecc: $(2,55 \cdot 1,00 \cdot 730)$ = 1860 kg/ml
- Tralzo $\left\{ \begin{array}{l} (550 \cdot 1,90 \cdot 1,00) = 1035 \\ (250 \cdot 1,90 \cdot 1,00) = 485 \end{array} \right.$
1520 = 1520 "
- Muratura di tamponamento = 1493 "
- P.P. = 400 "

→ 5073 kg/ml

(b) 3° ordinarie

- Solai ecc: $(3,92 \cdot 1,00 \cdot 835)$ = 3270 kg/ml
- Parafetto + tavellone = 518 "
- P.P. = 400 "

→ 4618 kg/ml

Travi: (6-1')

(1°-2°-3°) ordinarie

- Muratura di tamponamento = 1493 kg/ml
- P.P. = 400 "

→ 1893 kg/ml

Travi: (6-7)

① 1° e 2° ordine

- Solai + ecc: $(730 \cdot 3,20 \cdot 1,00)$ = 2350 kg/ml
 - Muratura di tamponamento = 1443 "
 - p.p. = 400 "
- 4100 kg/ml

② 3° ordine

- Solai + ecc: $(835 \cdot 3,80 \cdot 1,00)$ = 3170 kg/ml
 - Parapetto in calcestruzzo + tavellone = 518 "
 - p.p. = 400 "
- 4090 kg/ml

Travi: (7-8)

① 1° e 2° ordine

① Tratto (8-9)

- Solai + ecc: $(730 \cdot 3,13 \cdot 1,00)$ = 2260 kg/ml
 - Muratura di tamponamento = 1443 "
 - p.p. = 400 "
- 4103 kg/ml

② Tratto (7-8)

- Solai + ecc: $(730 \cdot 2,70 \cdot 1,00)$ = 1971 kg/ml
- Balzo: = 1456 "

$$\begin{cases} (650 \cdot 1,80 \cdot 1,00) = 1185 \text{ (solai)} \\ (150 \cdot 1,80 \cdot 1,00) = 270 \text{ (sovraccarico)} \end{cases}$$

1456 kg/ml

- Muratura di tamponamento = 1443 "
 - p.p. = 400 "
- 4600 kg/ml

② 3° ordine

- Solai + ecc: $(835 \cdot 3,80 \cdot 1,00)$ = 3170 kg/ml
 - Parapetto + tavellone = 518 "
 - p.p. = 400 "
- 4090 kg/ml

Travi: (11-12)

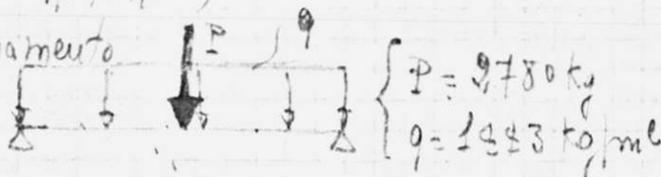
① 1° e 2° ordine

- Solato + ecc: $(730 \cdot 0,07 \cdot 1,00)$

$= 1500 \text{ kg/ml}$

- Muratura di tamponamento

schema statico



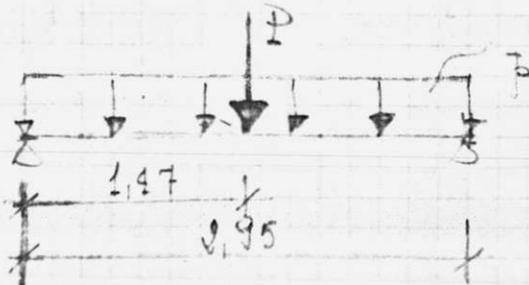
$\left\{ \begin{aligned} P &= 9780 \text{ kg} \\ q &= 1443 \text{ kg/ml} \end{aligned} \right.$

$= 1443 \text{ "}$

- p.p.

$= 400 \text{ "}$

Schema statico:



$\rightarrow 3343 \text{ kg/ml} = \bar{p}$

② 3° ordine

- Solato + ecc: $(835 \cdot 0,07 \cdot 1,00)$

$= 1740 \text{ kg/ml}$

- p.p.

$= 400 \text{ "}$

$\rightarrow 2140 \text{ kg/ml}$

Travi: (11-12)

Caratteristiche

- Muratura di tamponamento

$= 1000 \text{ kg/ml}$

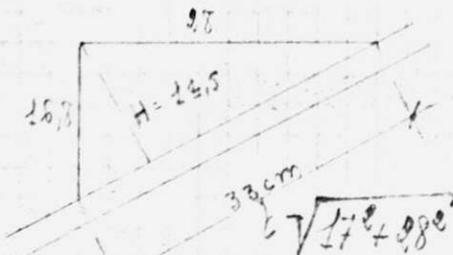
tutto: $(2,25 \cdot 3,10 \cdot 1600 \cdot 1,00) = 1000$

intonaco: $(0,07 \cdot 3,10 \cdot 1,00 \cdot 1/100) = 0,20$

1000 kg/ml

- Caricini e soletta

analisi di carichi riferiti a colun singolo gradino:



$H = \frac{17 \cdot 28}{33} = 24,5$

peso proprio gradino: $(0,18 \cdot 0,28) \cdot 2500 = 63 \text{ kg/m}$

soletta in radice: $(0,33 \cdot 0,04) \cdot 2500 = 33 \text{ "}$

malta intonaco: $(0,39 \cdot 0,015) \cdot 1500 = 8 \text{ "}$

malta allestimento gradino: $(0,30 + 0,17) \cdot 0,015 \cdot 1500 = 11 \text{ "}$

pedata: $0,35 \cdot 0,03 \cdot 2200 = 23 \text{ "}$

alzata: $(0,19 \cdot 0,03 \cdot 2200) = 6 \text{ "}$

sovraccarico = 915 kg

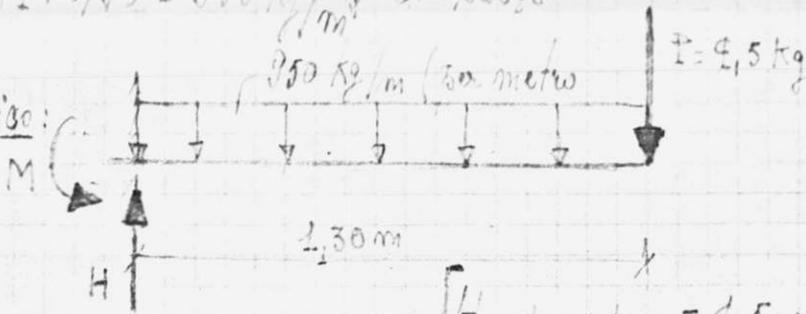
sovraccarico accidentale: $(400 \cdot 0,28) = 112 \text{ "}$

o.c.l.

Riferito ad un m² di stanza si ha:

$P_{01} = 0,93 = 950 \text{ kg/m}^2$ di stanza

Schema statico:

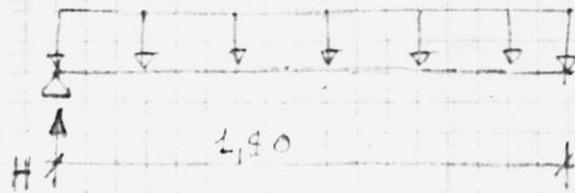


Reazioni: $\left\{ \begin{aligned} H \text{ metro di trave} &= 4,5 + 950 \cdot 1,3 = 1240 \text{ kg/m} \\ M \text{ metro di trave} &= 4,5 \cdot 1,30 + 950 \cdot \frac{1,30^2}{2} = 807 \text{ kgm/m} \end{aligned} \right.$

Pioggia

- peso soletto: $(110 \cdot 1,00) = 110 \text{ kg/m}$
 - malta intonaco: $(0,015 \cdot 1500 \cdot 1,00) = 23 \text{ "}$
 - malta a battimento esterno: $(0,015 \cdot 700 \cdot 1500) = 23 \text{ "}$
 - tegola: $(2,08 \cdot 1,50 \cdot 2000) = 66 \text{ "}$
 - sovraccarico di neve: $(500 \cdot 1,00) = 500 \text{ "}$
- $\underline{695 \text{ kg/m}}$ (per ogni metro di piano)

Schema statico:



Reazioni: $\left\{ \begin{aligned} H \text{ metro di trave} &= 695 \cdot 1,50 = 1042,5 \text{ kg/m} \end{aligned} \right.$

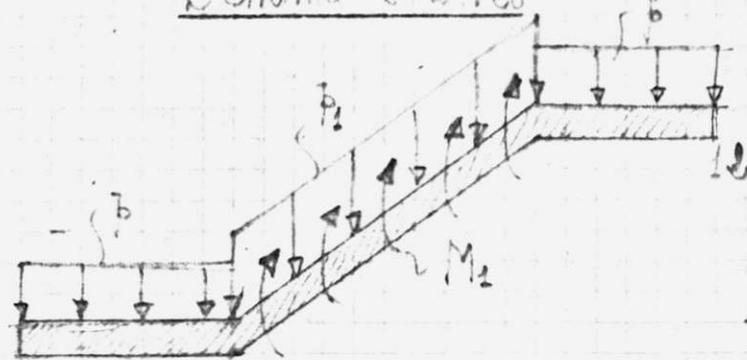
Peso proprio

Vertigine

$= 300 \text{ kg/m}$

Schema statico

Tramoggia 11-12



Carico totale $\left\{ \begin{aligned} P_1 &= 1042,5 \text{ kg/m} \text{ in corrispondenza dei gradini} \\ M_1 &= 810 \text{ kgm/m} \end{aligned} \right.$

Tramoggia 13-14



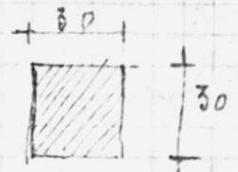
$\left\{ \begin{aligned} P &= 1330 \text{ kg/m} \text{ in corrispondenza dei rifiani} \end{aligned} \right.$

Analisi dei carichi sui pilastri

1. Pilastro 3

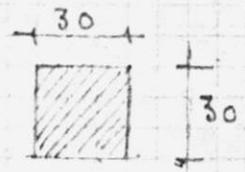
a) 3° ordine

$$\begin{aligned} \text{trave (2-3)} &: (9,07 \cdot 1900) &= 17233 \text{ kg} \\ \text{trave (3-4)} &: (2,55 \cdot 3900) &= 10005 \text{ kg} \\ \text{p.z.} &: (3,00 \cdot 0,30 \cdot 0,30 \cdot 4500) &= 1215 \text{ kg} \\ &&\rightarrow 7180 \text{ kg} \end{aligned}$$



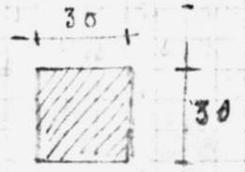
b) 2° ordine

$$\begin{aligned} \text{peso sovrastante} &= 7180 \text{ kg} \\ \text{trave (3-2)} &: (9,07 \cdot 1850) &= 16876 \text{ kg} \\ \text{trave (3-4)} &: (2,55 \cdot 3600) &= 9180 \text{ kg} \\ \text{p.z.} &= 680 \text{ kg} \\ &\rightarrow 17310 \text{ kg} \end{aligned}$$



c) 1° ordine

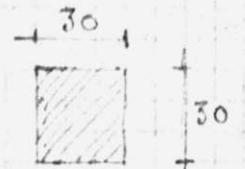
$$\begin{aligned} \text{peso sovrastante} &= 17310 \text{ kg} \\ \text{trave [(3-2)+(3-4)]} &= 9450 \text{ kg} \\ \text{p.z. rettang.} &: (0,03 \cdot 0,66 \cdot 9500) \cdot 3,68 &= 680 \text{ kg} \\ \text{p.z.} &= 680 \text{ kg} \\ &\rightarrow 27990 \text{ kg} \end{aligned}$$



2. Pilastro 4

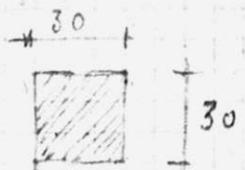
a) 3° ordine

$$\begin{aligned} \text{trave (2-3)} &= 5000 \text{ kg} \\ \text{trave (4-9)} &: (9,57 \cdot 3900) &= 37523 \text{ kg} \\ \text{p.z.} &= 680 \text{ kg} \\ &\rightarrow 13980 \text{ kg} \end{aligned}$$



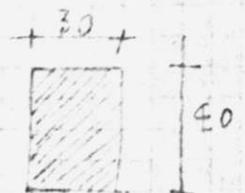
b) 2° ordine

$$\begin{aligned} \text{peso sovrastante} &= 13980 \text{ kg} \\ \text{trave (4-3)} &= 5600 \text{ kg} \\ \text{trave (4-9)} &: (9,57 \cdot 3600) &= 34452 \text{ kg} \\ \text{p.z.} &= 680 \text{ kg} \\ &\rightarrow 29560 \text{ kg} \end{aligned}$$



c) 1° ordine

$$\begin{aligned} \text{peso sovrastante} &= 29560 \text{ kg} \\ \text{trave [(4-3)+(4-9)]} &= 5600 \text{ kg} \\ \text{p.z. rettang.} &: (0,03 \cdot 0,66 \cdot 9500) \cdot 2,18 &= 550 \text{ kg} \\ \text{p.z.} &: (0,30 \cdot 0,90 \cdot 3,00 \cdot 9500) &= 900 \text{ kg} \\ &\rightarrow 45910 \text{ kg} \end{aligned}$$



Pilastro 9

a) 3° ordine

trave (9-4):

= 8300 kg

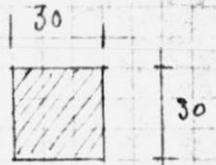
trave (9-10): (1,92 · 3200)

= 7800 "

p.p.

= 680 "

→ 16780 kg



b) 2° ordine

peso sovrastante:

= 15780 kg

trave (9-9):

= 9300 "

trave (9-10): { 20 · 4100

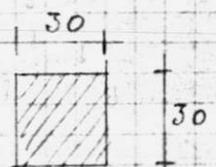
= 8600 "

p.p.

= 875 "

= 68 "

→ 36235 kg



c) 1° ordine

peso sovrastante

= 36235 kg

trave: [(9-4) + (9-10)]

= 18775 "

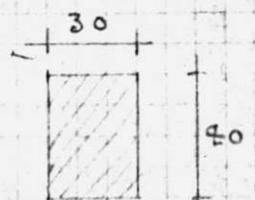
p.z. velle: (0,08 · 0,66 · 2500) · 4,99

= 660 "

p.p.

= 900 "

→ 56470 kg



Pilastro 10

a) 3° ordine

trave (10-9):

= 7800 kg

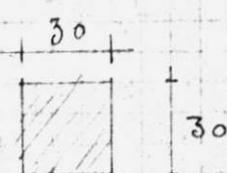
trave (10-15): (3000 · 1,48)

= 4750 "

p.p.

= 680 "

→ 13230 kg



b) 2° ordine

peso sovrastante

= 13230 kg

trave (10-9): { 12,75 · 3600

= 46000 "

p.p.

= 875 "

trave (10-15): { 1,48 · 3600

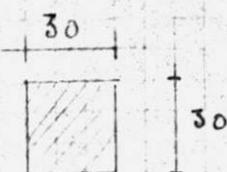
= 5300 "

p.p.

= 920 "

= 680 "

→ 30005 kg



c) 1° ordine

peso sovrastante

= 30005 kg

trave: [(10-9) + (10-15)]

= 17095 "

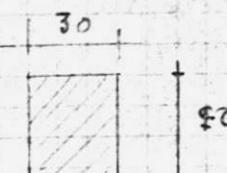
p.z. velle: (0,08 · 0,66 · 389) · 2500

= 520 "

p.p.

= 900 "

→ 48520 kg



Pilastro 4

3° ordine

$$\text{trave (4-5)}: (1,55 \cdot 4000)$$

$$= 6200 \text{ kg}$$

$$\text{trave (4-3)}: (0,07 \cdot 1000)$$

$$= 700 \text{ "}$$

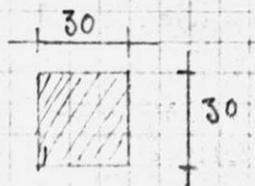
$$\text{trave (4-1)}: (0,17 \cdot 2000)$$

$$= 3400 \text{ "}$$

p.p.

$$= 680 \text{ "}$$

$$\rightarrow 11980 \text{ kg}$$



2° ordine

$$\text{trave (4-5)}: (1,55 \cdot 4100)$$

$$= 6355 \text{ kg}$$

$$\text{trave (4-3)}: (0,07 \cdot 1850)$$

$$= 1295 \text{ "}$$

$$\text{trave (4-1)}: (0,17 \cdot 1850)$$

$$= 3145 \text{ "}$$

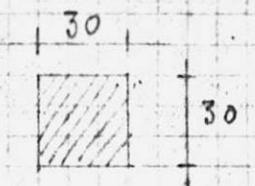
peso sovrastante

$$= 11980 \text{ "}$$

p.p.

$$= 680 \text{ "}$$

$$\rightarrow 26910 \text{ kg}$$



1° ordine

peso sovrastante

$$= 26910 \text{ kg}$$

$$\text{travi: } [(4-5) + (4-3) + (4-1)]$$

$$= 14850 \text{ "}$$

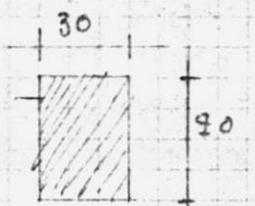
$$\text{peso vellea: } (0,08 \cdot 0,88 \cdot 9500) \cdot 4,22$$

$$= 746 \text{ "}$$

p.p.

$$= 900 \text{ "}$$

$$\rightarrow 49806 \text{ kg}$$



Pilastro 5

3° ordine

$$\text{trave (5-4)}: (1,55 \cdot 4000)$$

$$= 6200 \text{ kg}$$

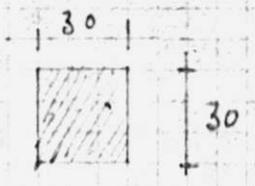
$$\text{trave (5-8)}: (0,57 \cdot 4500)$$

$$= 2565 \text{ "}$$

p.p.

$$= 680 \text{ "}$$

$$\rightarrow 18480 \text{ kg}$$



2° ordine

peso sovrastante

$$= 18480 \text{ kg}$$

$$\text{trave (5-4)}: (1,55 \cdot 4100)$$

$$= 6355 \text{ "}$$

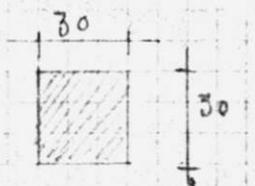
$$\text{trave (5-8)}: (0,57 \cdot 4600)$$

$$= 2622 \text{ "}$$

p.p.

$$= 680 \text{ "}$$

$$\rightarrow 37350 \text{ kg}$$



1° ordine

peso sovrastante

$$= 37350 \text{ kg}$$

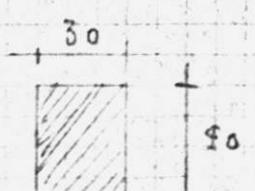
$$\text{travi: } [(5-4) + (5-8)]$$

$$= 13200 \text{ "}$$

p.p.

$$= 900 \text{ "}$$

$$\rightarrow 56460 \text{ kg}$$



Pilastro 8

3ª ordene

trave (8-5): $(2,57 \cdot 2500)$

= 6425 kg

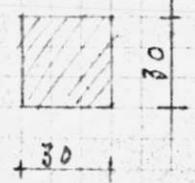
trave (8-11): $(2,99 \cdot 2500)$

= 7475 "

p.p.

= 680 "

→ 23.170 kg



2ª ordene

peso sovrastante

= 23.170 kg

trave (8-5): $(2,57 \cdot 2600)$

= 6682 "

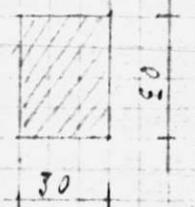
trave (8-11): $(2,99 \cdot 2600)$

= 7774 "

p.p.

= 680 "

→ 46.780 kg



1ª ordene

peso sovrastante

= 46.780 kg

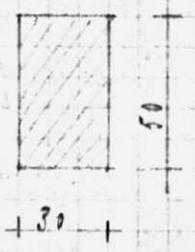
trave [(8-5) + (8-11)]:

= 99.930 "

p.p.

= 900 "

→ 70.614 kg



Pilastro 11

3ª ordene

trave (11-8): $(2,59 \cdot 2500)$

= 6475 kg

trave (11-14): $(2,97 \cdot 2500)$

= 7425 "

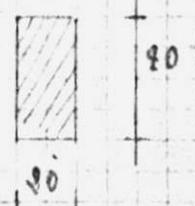
trave (11-10): $(2,97 + 1,7) \cdot 2380 + (2,26 \cdot 2720)$

= 7420 "

p.p.: $(0,20 \cdot 0,30 \cdot 3,00 \cdot 2500)$

= 450 "

→ 21.990 kg



2ª ordene

peso sovrastante

= 21.990 kg

trave (11-8): $(2,59 \cdot 2600)$

= 6734 "

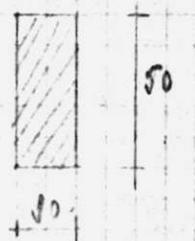
trave [(11-14) + (11-10)]

= 10.580 "

p.p.: $(0,20 \cdot 0,50 \cdot 3,00 \cdot 2500)$

= 750 "

→ 44.380 kg



1ª ordene

peso sovrastante

= 44.380 kg

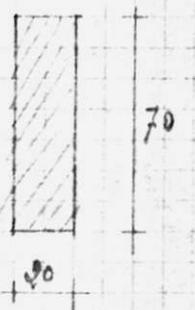
trave [(11-8) + (11-14) + (11-10)]

= 21.710 "

p.p.: $(0,20 \cdot 0,70 \cdot 3,00 \cdot 2500)$

= 1050 "

→ 67.544 kg



Pilastro 1

3^o ordine

trave (1-2): $(4,17 \cdot 1000)$

= 2600 kg

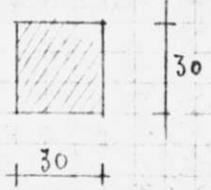
trave (1-1'): $(1,95 \cdot 2500)$

= 8970 "

p.p.

= 580 "

→ 19.850 kg



2^o ordine

peso sovrastante:

= 19.850 kg

trave (2-2): $(2,17 \cdot 1850)$

= 4000 "

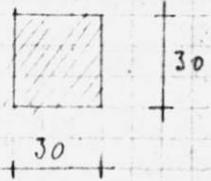
trave (2-1'): $(1,95 \cdot 5100)$

= 9945 "

p.p.

= 580 "

→ 26.875 kg



1^o ordine

peso sovrastante

= 26.875 kg

trave: $[(1-2) + (2-1')]$

= 13.945 "

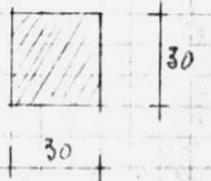
peso nella trave: $[0,08 \cdot 0,88] \cdot (4,17 + 1,55) \cdot 2500$

= 655 "

p.p.

= 900 "

→ 49.375 kg



Pilastro 1'

3^o ordine

trave (1'-2): $(1,55 \cdot 4500)$

= 7130 kg

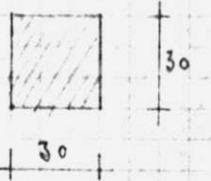
trave (1'-6): $(0,62 \cdot 1900)$

= 1178 "

p.p.

= 680 "

→ 8.988 kg



2^o ordine

peso sovrastante

= 8.988 kg

trave (2'-2): $(1,55 \cdot 5100)$

= 7905 "

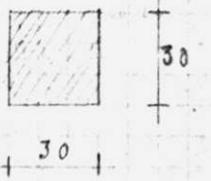
trave (2'-6): $(0,62 \cdot 1900)$

= 1178 "

p.p.

= 680 "

→ 18.751 kg



1^o ordine

peso sovrastante

= 18.751 kg

trave: $(2'-2) + (2'-6)$

= 9083 "

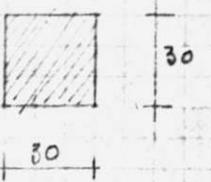
peso nella trave: $[1,55 + 0,62] \cdot 0,08 \cdot 0,88 \cdot 2500$

= 382 "

p.p.

= 680 "

→ 28.896 kg



Pilastro 6

3º orçome

$$\text{trave (6-2')} : (0,68 \cdot 2900)$$

$$= 1978 \text{ kg}$$

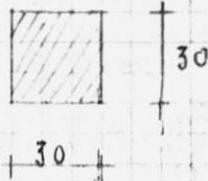
$$\text{trave (6-7)} : (2,57 \cdot 4100)$$

$$= 10537 \text{ "}$$

p.p.

$$= 680 \text{ "}$$

$$\rightarrow 12195 \text{ kg}$$



2º orçome

peso sobra taute

$$= 12195 \text{ kg}$$

$$\text{trave (6-1')} : (0,68 \cdot 1900)$$

$$= 1278 \text{ "}$$

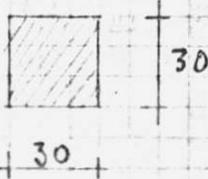
$$\text{trave (6-7)} : (2,57 \cdot 4100)$$

$$= 10537 \text{ "}$$

p.p.

$$= 680 \text{ "}$$

$$\rightarrow 12490 \text{ kg}$$



1º orçome

peso sobra taute

$$= 12490 \text{ kg}$$

$$\text{trave: } [(6-1') + (6-7)]$$

$$= 11715 \text{ "}$$

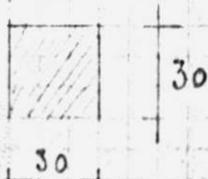
$$\text{peso releta: } 2,57 \cdot 176$$

$$= 452 \text{ "}$$

p.p.

$$= 680 \text{ "}$$

$$\rightarrow 37637 \text{ kg}$$



Pilastro 7

3º orçome

$$\text{trave (7-6)} : (2,57 \cdot 4100)$$

$$= 10537 \text{ kg}$$

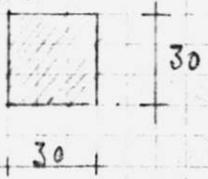
$$\text{trave (7-12)} : (2,49 \cdot 4100)$$

$$= 9999 \text{ "}$$

p.p.

$$= 680 \text{ "}$$

$$\rightarrow 21139 \text{ kg}$$



2º orçome

peso sobra taute

$$= 21139 \text{ kg}$$

$$\text{trave (7-6)} : (2,57 \cdot 4100)$$

$$= 10537 \text{ "}$$

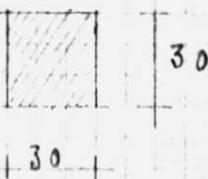
$$\text{trave (7-12)} : (2,49 \cdot 4600)$$

$$= 11438 \text{ "}$$

p.p.

$$= 680 \text{ "}$$

$$\rightarrow 23258 \text{ kg}$$



1º orçome

peso sobra taute

$$= 23258 \text{ kg}$$

$$\text{travi: } [(7-6) + (7-12)]$$

$$= 21669 \text{ "}$$

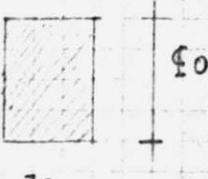
$$\text{p. releta: } (2,57 + 2,49) \cdot 176$$

$$= 878 \text{ "}$$

p.p.

$$= 900 \text{ "}$$

$$\rightarrow 66935 \text{ kg}$$



Pilastro 12

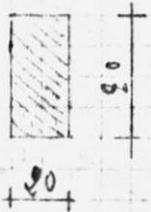
3ª ordina

trave (12-7) : $(2,44 \cdot 9100) = 9.999 \text{ kg}$

trave (12-11) : $[(0,97 + 0,7) \cdot 2380] + (1,26 \cdot 2790) = 7.420 \text{ "}$

p.p. = $\underline{950 \text{ "}}$

→ 17.799 kg



2ª ordina

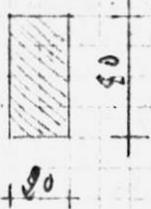
peso sovrastante = 17.799 kg

trave (12-7) : $(2,44 \cdot 9900) = 10.668 \text{ "}$

trave (12-11) : = 7.420 "

p.p. = $\underline{600 \text{ "}}$

→ 36.450 kg



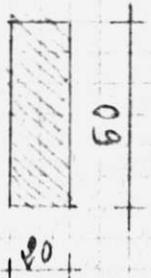
1ª ordina

peso sovrastante = 36.450 kg

trave : (12-7) + (12-11) = 18.068 "

p.p. = $\underline{900 \text{ "}}$

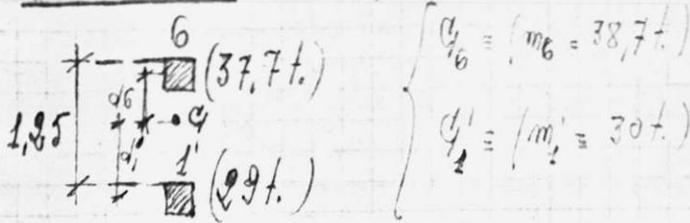
→ 55.428 kg



Dimensionamento dei pilastri

Prendiamo una $\sigma_c = 3,5 \text{ kg/cm}^2$

Pilastro 1-6 (30x30)



$$\begin{cases} d_6 + d_1' = d = 1,25 \text{ m} \\ d_6 : d_1' = m_6 : m_1' \end{cases} \quad d_6 = \frac{d_1' \cdot m_1'}{m_6} ; \quad \frac{d_1' \cdot m_1'}{m_6} + d_1' = d$$

$$d_1' (m_1' + m_6) = d_6 \cdot m_6$$

$$\begin{cases} d_1' = \frac{d \cdot m_6}{m_1' + m_6} = \frac{1,25 \cdot 38,7}{58,7} = 0,71 \text{ cm} \\ d_6 = 1,25 - 0,71 = 0,54 \text{ cm} \end{cases}$$

Rispetto ai fili fissi si ha:

$$\begin{cases} d_1' = 0,71 - 0,15 = 0,56 \text{ m} \\ d_6 = 0,54 + 0,15 = 0,69 \text{ m} \end{cases}$$

(carico alla base del pilastro) $P = 18756 \text{ kg}$; dimensioni del plinto: $(1,00 \cdot 0,50)$; altezza del plinto: $h = 0,60 \text{ m}$

Pilastro: (1-2-3-4)

$P = 48500 \text{ kg}$; $(1,20 \times 1,20) \text{ m}$; $h = 0,60 \text{ m}$

Pilastro: (5-6) (30x40)

$P = 56500 \text{ kg}$; $(1,30 \times 1,30)$; $h = 0,60 \text{ m}$

Pilastro: (8-7) $\left\{ \begin{array}{l} (30 \times 40) : 7 \\ (30 \times 50) : 8 \end{array} \right.$

$P = 70500 \text{ kg}$; $(1,50 \times 1,50)$; $h = 0,60 \text{ m}$

Pilastro: (12) (40x60)

$P = 55500 \text{ kg}$; $(1,10 \times 1,50)$; $h = 0,60 \text{ m}$

Pilastro: (11) (40x70)

$P = 67500 \text{ kg}$; $(1,40 \times 1,60)$; $h = 0,60 \text{ m}$

Pilastro: (3) (30x30)

$P = 18000 \text{ kg}$; $(1,00 \times 1,00)$; $h = 0,60 \text{ m}$

Plinto No	Dimensioni (m x m)	Carico all'incastro (kg)	Forz. P. Cud. (kg)	Carico sul fondello (kg/cm ²)	M ₁ (kgm)	Gr/Gr	FP _{1A} (gmm)	M ₂ (kgm)	Gr/Gr	FP _{2B} (gmm)	T _{max} /T _{min} (kg/cm ²)	FP _{1A} (gmm)	FP _{2B} (gmm)
1-2-4-11 24-23-21-15	(2,800 x 1,80)	93.500	8.260	3,52	3.032	2500/23	4	/	/	/	20.230/1.788	9,8	/
(2-6) (19-22)	(2,500 x 2,50)	70.935	3.750	1,80	5.460	2500/27	7,3	/	/	/	/	/	/
3-22	(2,000 x 1,00)	87.990	2.500	1,92	2.872	2500/30	2,7	/	/	/	/	/	/
5-20 2-26	(2,300 x 2,30)	66.470	1.535	3,99	3.955	2500/39	6,85	/	/	/	25.222/1.924	5,7	/
1-18 (3-17)	(2,500 x 2,50)	70.675	3.375	3,29	6.278	2500/22	8,5	/	/	/	27.652/1.442	6	/
(11-15) (10 x 20)	(2,800 x 1,60)	67.654	1.880	3,70	5.065	2500/28	6,7	30,90	2500/23	5,2	/	4,7	3
(12-13) 20 x 60	(2,250 x 2,80)	55.298	1.575	3,52	3.666	2500/28	4,8	19,56	2500/50	3,7	/	3,2	2,6