



ISTITUTO AUTONOMO CASE POPOLARI - BRINDISI -

GESTIONE CASE PER LAVORATORI

COSTRUZIONE DI 2 CASE PER LAVORATORI IN FRANCAVILLA
FONTANA (BRINDISI) PER COMPLESSIVI ALLOGGI 18
PROGRAMMA 57 - Legge 14/2/1963 n.60

Impresa: Consorzio Ravennate Cooperative Prod.Lavoro
Ravenna

EDIFICIO C-D

CALCOLI STATICI 1)

A.C.E.R. UFFICIO TECNICO
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Zaccarelli

ANALISI DEI CARICHISolaio piano praticabile di copertura

Peso proprio solaio laterocemento a camera d'aria, con soletta c.c.	280	Kg/m ²
Pavimento e intonaco	90	"
Massetto di pend.	90	"
Sovrac. accidentale	250	"
	710	Kg/m ²

Solaio tipo

Peso proprio : (I6x40)	140	Kg/m ²
Soletta 3 cm.	72	"
Pavimento e int.	100	"
Sovrac. accidentale	250	"
	562	Kg/m ²
	70	"
	632	Kg/m ²

TramezzatureS C A L E :

Peso proprio	375	Kg/m ²
Marmo e intonaco	100	"
Sovr. accidentale	400	"
	875	Kg/m ²

Ripiani :

Come solai	562	Kg/m ²
Maggior sovraccarico (400-250)	150	"
	712	Kg/m ²

Murature :

Tamponamento esterno (20+10) 470 Kg/m²
Per piano : 470x3 = 1410 Kg/m

Vano scala (20) 340 Kg/m²

Per piano : 340 x 3 = 1020 Kg/m

Tramezzi

In forati da 8 100 Kg/m²
Per piano : 100 x 3 = 300 Kg/m

Doppio forato da 8 150 Kg/m²
Per piano: 150x3 = 450 Kg/m

CARICHI SULLE TRAVITravi I-2 , 2-3

Terrazzo : peso proprio 1005 Kg/m
solaio; 710x3.75/2 1330 "

2335 Kg/m

Piani : peso proprio 375 Kg/m
solaio: 632x3.75/2 1180 "
muratura: 1410x0.90 1265 "

2820 Kg/m

Trave 3-4

<u>terra 220</u> :	p.p.	1.005 Kg/m
	solaio : 710x2,725	1.930 "
		2.935 Kg/m

Piani :

p.p.	375 Kg/m
solaio: 632x2.725	I.720 "
muratura:	I.265 "
	3.360 Kg/m

Travi : 5-6 ; 6-7 ; 7-8

<u>Terrazzo</u> :	p.p.	300 Kg/m
	solaio: 710x3.95	2.800 "
		3.100 Kg/m

<u>Piani</u> :	p.p.	300 Kg/m
	solaio: 632x3.95	2.500 "
		2.800 Kg/m

Trave 9-10-II

Terra 220	p.p.	1.005 Kg/m
	solaio : 710x ($\frac{4.75}{2} + 1.30$)	2.600 "
		3.605 Kg/m

<u>Piani</u> :	p.p.	375 Kg/m
	solaio: 632x3.65	2.300 "
	muratura :	1.410 "
		4.085 Kg/m

Mensola 9

<u>Terrazzo</u> :	p.p.	1005 Kg/m
	solaio: 710x2,20	1500 "
		2500 Kg/m

<u>Piani</u> :	p.p.	200 Kg/m
	solaio 700x2,20+2,00	1700 "
		1900 Kg/m

m = 3800 Kgm.

Trave II -I2

<u>Terrazzo</u> :	p.p.	1005 Kg/m
	solaio: 710x1	710 "
		1715 Kg/m

<u>Piani</u> :	p.p.	375 Kg/m
	solaio: 632x I	632 "
	muratura: 1410x0,90	1265 "
		2272 Kg/m

Trave I3-I4

<u>Terrazzo</u> :	p.p.	1000 Kg/m
	solaio: 710x1,50	1060 "
		2060 Kg/m

<u>Piani</u> :	p.p.	375 Kg/m
	solaio : 632x1,50	950 "
	muratura	1410 "
		2735 Kg/m

Trave I5-I6

Torrino : p.p. 375 Kg/m
solaio: 500xI.70 850 "

1225 Kg/m

Terrazzo : p.p. 400 "
solaio: 710xI 710 "
scala: 875xI.20 1050 "
muratura: 340x2 680 "

2840 Kg/m

Piani : p.p. 400 "
solaio: 632xI 632 "
scala 1050 "
muratura 1020 "

3102 Kg/mTrave I6-I7

Torrino: (come I5-I6) 1225 Kg/m

Terrazzo : p.p. 300 Kg/m
solaio: 710x3,65/2 1250 "
scala : 1050 "
muratura: 340xI,50 500 "

3100 Kg/m

Piani : p.p. 300 Kg/m
solaio: 632x3.55/2 1100 "
muratura: 340xI 340 "

1740 Kg/m



<u>a quota rampe</u> :	p.p.	300	Kg/m
	rampa: 875x1.20	1050	"
	muratura: 1020/2	510	"
		1860	Kg/m

Travi 17-18-19

<u>Terrazzo</u> :	pp.	300	Kg/m
	solaio: 710x4.20	3000	"
		3300	Kg/m

<u>Piani</u> :	pp	300	Kg/m
	solaio: 632x4.20	2650	"
		2950	Kg/m

Travi 19 - 20

<u>Terrazzo</u> :	pp	1000	Kg/m
	solaio 710x4.20	3000	"
		4000	Kg/m

<u>Piani</u> :	pp	375	Kg/m
	solaio: 632x3.55/2	1100	"
	muro :	1410	"
		2885	Kg/m

Travi 21 - 22

<u>Terrazzo</u> :	pp.	300	Kg/m
	solaio: 710x3.90	2760	"
		3060	Kg/m



<u>Piani</u> :	pp.	300	Kg/m
	solaio: 632x3.90	2460	"
		2760	Kg/m

Travi 22 - 23 - 24

<u>Terrazzo</u> :	pp.	300	Kg/m
	solaio: 710x4.80	3400	"
		3700	Kg/m

<u>Piani</u> :	pp.	300	Kg/m
	solaio: 632x4.80	3000	"
		3300	Kg/m

Travi 24 - 25

<u>Torrino</u> :		1225	Kg/m
<u>Terrazzo</u> :	pp.	300	"
	solaio: 710x2.10	1500	"
	ripiano: 710x1.20	850	"
	muro: 340x2	680	"
		3330	Kg/m

<u>Piani</u> :	pp.	300	Kg/m
	solaio: 632x2.10	1320	"
	ripiano: 710x1.20	850	"
	muro: 340x3	1020	"
		3490	Kg/m

T₂₅ - 26

<u>Torrino</u>		1225	Kg/m
<u>Terrazzo</u> :	p.p.	1000	"
		680	"
		850	"
		2530	Kg/m



<u>Piani</u> :	pp.	300	Kg/m
	ripiano :	850	"
	muratura:	1200	"
		2350	Kg/m

T 27 - 28 - 29

<u>Terrazzo</u> :	pp	1000	Kg/m
	solaio: 710x2.12	1500	"
		2500	Kg/m

<u>Piani</u> :	pp	375	Kg/m
	solaio: 632x2.12	1340	"
	muratura: 1410	1410	"
		3125	Kg/m

T 30-31-32-33-34

<u>Terrazzo</u> :	pp	1000	Kg/m
	solaio: 710x2.10	1500	"
		2500	Kg/m

<u>Piani</u> :	pp	375	Kg/m
	solaio: 632x2.10	1340	"
	muratura: 1410x0.90	1265	"
		2980	Kg/m



T
I- 5 - 12
4 - 8
8 - 20
9 - 14
13 - 21 - 30
25 - 34
26 - 27

Terrazzo : pp. 1155 Kg/m

Piani : pp: 375+100 475 Kg/m
muratura 1410 "

1885 Kg/m

T
19 - 29

Terrazzo : 1155 Kg/m

Piani : pp. 475 Kg/m
muratura: 1410 "
balcone: (710x2)x
x2x3/4.25 2000 "

3885 Kg/m

T
15 - 24

17 - 26 :

Terrazzo: pp 300 Kg/m
e piani : muro 1020 "

1320 Kg/m

CARICHI SUI PILASTRIPILASTRO 1

<u>Terrazzo:</u>	$T_{I-2} : 2335 \times 1.80$	= 4.200 Kg.
	$T_{I-5} : 1155 \times 2.05$	= 2.360 "
<u>Piani</u> :	$T_{I-2} : 2820 \times 1.65 \times 3$	= 14.000 "
	$T_{I-5} : 1885 \times \frac{6.75}{2} \times 3$	= 10.600 "
Peso proprio pilastro:		= 3.000 "
		34.160 Kg.

PILASTRO 2

<u>Terrazzo</u> :	$T_{I-2-3} : 2335 \times 3.80$	= 8.900 Kg.
<u>Piani</u> :	$T_{I-2-3} : 2820 \times 3.80 \times 3$	= 32.000 "
	p.p. pilastro	= 3.000 "
		43.900 Kg.

PILASTRO 3

<u>Terrazzo</u> :	$T_{2-3} : 2335 \times 1.90$	= 4.450 Kg.
	$T_{3-4} : 2935 \times 2.20$	= 6.500 "



<u>Piani</u> :	T_{2-3} :	2820x1.90x3	=	16.000	Kg.
	T_{3-4} :	3360x2.20x3	=	22.200	"
	p.p. pilastro	4.10	=	3.000	"
				52.150	Kg.

PILASTRO 4

<u>Terrazzo</u> :	T_{3-4} :	2935x2.05	=	6.000	Kg.
	T_{4-8} :	1155x2.85	=	3.300	"
<u>Piani</u> :	T_{3-4} :	3360x1.90x3	=	19.000	"
	T_{4-8} :	1185x2.70x3	=	15.300	"
	p.p. pilastro		=	3.000	"
				46.600	Kg.

PILASTRO 5

<u>Terrazzo</u> :	T_{I-5-I2} :	1155x2.50	=	2.800	Kg.
	T_{5-6} :	$3100 \times \frac{4.95}{2}$	=	7.700	"
<u>Piani</u> :	T_{I-5-I2} :	1885x2.50x3	=	14.100	"
	T_{5-6} :	$2800 \times \frac{4.95}{2} \times 3$	=	20.800	"
	p.p. pilastro :		=	3.000	"
				48.400	Kg.

PILASTRO 6

<u>Terrazzo</u> :	T ₅₋₆₋₇ :	3100x4.20	= 13.000 Kg.
<u>Piani</u> :	" :	2800x4.20x3	= 35.200 "
	p.p. pilastro i		= 3.000 "
			51.200 Kg.

PILASTRO 7

<u>Terrazzo</u> :	T ₆₋₇₋₈ :	3100x3.25	= 10.200 Kg.
	" :	2800x3.25x3	= 27.300 "
	p.p. pilastro		= 3.000 "
			40.500 Kg.

PILASTRO 8

<u>Terrazzo</u> :	T ₇₋₈ :	3100x1.52	= 4.700 "
	T ₄₋₈₋₂₀ :	1155x3.65	= 4.200 "
<u>Piani</u> :	T ₄₋₈ :	2800x1.52x3	= 12.800 "
	T ₄₋₈₋₂₀ :	1885x3.65x3	= 20.700 "
	p.p. pilastro		= 3.000 "
			45.400 Kg.

PILASTRO 9

<u>Terrazzo</u> :	$M_9 : 2500 \times 2$	= 5.000 Kg.
	$T_{9-10} : 3605 \times 2.02$	= 7.300 "
<u>Piani</u> :	$M_9 : 1900 \times 2$	= 3.800 "
	$T_{9-10} : 4085 \times 2.02 \times 3$	= 24.700 "
	Reazione $M_9 : 700 \times 4$	= 2.800 "
	p.p. pilastro	= 3.000 "
		= 46.600 Kg.

PILASTRO 10

<u>Terrazzo</u> :	$T_{9-10-11} : 3605 \times 3.52$	= 12.700 Kg.
<u>Piani</u> :	" : $4085 \times 3.52 \times 3$	= 43.200 "
	p.p. pilastro	= 3.000 "
		58.900 Kg.

PILASTRO 11

<u>Terrazzo</u> :	$T_{10-11} : 3605 \times 1.20$	= 4.300 Kg.
	$T_{11-12} : 1715 \times 1.75$	= 3.000 "
<u>Piani</u> :	$T_{10-11} : 4085 \times 1.20 \times 3$	= 14.750 "
	$T_{11-12} : 2272 \times 1.75 \times 3$	= 12.000 "
	Muri: $1400 \times 1 \times 3$	= 4.200 "
	p.p. pilastro	= 3.000 "
		41.250 Kg.

PILASTRO I2

<u>Terrazzo</u> :	$T_{II-I2} : 1715 \times 1.75$	= 3.000 Kg.
	$T_{5-I2} : 1155 \times 0.65$	= 750 "
<u>Piani</u> :	$T_{II-I2} : 2272 \times 1.75 \times 3$	= 12.000 "
	$T_{5-I2} : 1885 \times 0.65 \times 3$	= 3.700 "
	divisori : $450 \times 1 \times 3$	= 1.350 "
	p.p. pilastro:	= 3.000 "
		23.800 Kg.

PILASTRO I3

<u>Terrazzo</u> :	$T_{I3-I4} : 2060 \times 2.10$	= 4.300 Kg.
	$T_{I3-2I} : 1155 \times 1.80$	= 2.080 "
<u>Piani</u> :	$T_{I3-I4} : 2735 \times 2.10 \times 3$	= 17.300 "
	$T_{I3-2I} : 1885 \times 1.50 \times 3$	= 8.500 "
	pp.pilastro	= 3.000 "
		35.180 Kg.

PILASTRO I4

<u>Terrazzo</u> :	$T_{I3-I4} : 2060 \times 2.10$	= 4.300 Kg.
	$T_{I4-9} : 1155 \times 0.50$	= 600 "
<u>Piani</u> :	$T_{I3-I4} : 2735 \times 2.10 \times 3$	= 17.300 "
	$T_{I4-9} : 1885 \times 0.50 \times 3$	= 2.850 "



balconi : (710x0.75x1.5)x4	= 3.200 Kg.
p.p. pilastro	= 3.000 "
	31.250 Kg.

PILASTRO I5

<u>Terrazzo</u> : T _{I5-I6} : 1225x1.50	= 1.840 Kg.
" : 2840x1.50	= 4.260 "
T _{I5-24} : 1320x1.25	= 700 "
" : 400x1.75	= 700 "
<u>Piani</u> : T _{I5-I6} : 3102x1.50x3	= 14.000 "
T _{I5-24} : 1320x1,25x3	= 4.960 "
p.p. pilastro	= 3.000 "
	30.410 Kg.

PILASTRO I6

<u>Terrazzo</u> : T _{I5-I6} : 1225x1.60	= 1.960 Kg.
" : 2840x1.60	= 4.550 "
T _{I6-I7} : 1225x2.65	= 3.250 "
" : 3100x2.65	= 8.250 "
<u>Piani</u> : T _{I5-I6} : 3102x1.60x3	= 15.000 "
T _{I6-I7} : 1740x2.65x3	= 14.000 "
" : 1860x2.65x4	= 19.800 "
divisori: (come I2)	= 10350 "
p.p. pilastro	= 3.000 "
	71.160 Kg.

PILASTRO I7

<u>Terrazzo</u> :	T _{I6-I7} :	I225x2.50	= 3100 Kg.
	" :	3100x2.50	= 7800 "
	T _{I7-I8} :	3300xI.70	= 5600 "
	T _{I7-26} :	I320xI.25	= I650 "
	" :	400xI.75	= 700 "
<u>Piani</u> :	T _{I6-I7} :	I740x2.50x3	=I3000 "
	" :	I860x2.50x3	=I4000 "
	T _{I7-I8} :	2950xI.70x3	=I5000 "
	T _{I7-26} :	I320xI.25x3	= 4960 "
	p.p. pilastro		= 3000 "
			68810 Kg.

PILASTRO I8

<u>Terrazzo</u> :	T _{I7-I8-I9} :	3300x2.80	9200 Kg.
<u>Piani</u> :	" :	2950x2.80x3	24700 "
	p.p. pilastro :		3000 "
			36.900 Kg.

PILASTRO I9

<u>Terrazzo</u> :	T _{I8-I9} :	3300xI.075	3.540 Kg.
	T _{I9-20} :	4000x0.60	2.400 "
	T _{I9-29} :	II55x2.I25	2.450 "
			8.390 Kg.



<u>Piani</u>	:	T _{I8-I9} : 2950x1.075x3	= 9500 Kg.
		T _{I9-20} : 2885x0.60x3	= 5200 "
		T _{I9-29} : 3885x2.125x3	= 25000 "
		pp. pilastro	= 3000 "
			51.090 Kg.

PILASTRO 20

<u>Terrazzo</u>	:	T _{I9-20} : 4000x0,30	1.200 Kg.
		T ₈₋₂₀ : 1155x1.80	2.080 "
<u>Piani</u>	:	T _{I9-20} : 2885x0,30x3	2.600 Kg.
		T ₈₋₂₀ : 1885x1.80x3	10.200 "
		pp. pilastro	3.000 "
		balconi: 710x1.20x1.50x3	3.800 "
			22.880 Kg.

PILASTRO 21

<u>Terrazzo</u> :	T _{I3-21-30} : 1155x3.90	4.500 Kg.
	T ₂₁₋₂₂ : 3060x2.10	6.450 "
<u>Piani</u> :	T _{I3-21-30} : 1885x3.60x3	20.300 "
	T ₂₁₋₂₂ : 2760x2.10x3	17.400 "
	p.p. pilastro:	3.000 "
		51.650 Kg.

PILASTRO 22

<u>Terrazzo</u> :	T _{2I-22-23} :	3060x4,42	=	13500	Kg.
<u>Piani</u> :	"	: 2760x4,42x3	=	36500	"
	p.p. pilastro		=	3000	"
				53000	Kg.

PILASTRO 23

<u>Terrazzo</u> :	T ₂₂₋₂₃₋₂₄ :	3060x3,52	=	10800	Kg.
<u>Piani</u> :	"	: 2760x3,52x3	=	29000	"
	p.p. pilastro		=	3000	"
				42800	Kg.

PILASTRO 24

<u>Terrazzo</u> :	T ₂₃₋₂₄ :	3700xI,20	=	4440	Kg.
	T ₂₄₋₂₅ :	I225x2,30	=	2820	"
	T "	: 3330x2,30	=	7660	"
	T _{I5-24} :	I320 xI,25	=	I650	"
	"	400xI,75	=	700	"
<u>Piani</u> :	T ₂₃₋₂₄ :	3300xI,20x3	=	I2000	"
	T ₂₄₋₂₅ :	3490x2,30x3	=	24200	"
	T _{I5-24} :	I320xI,25x3	=	4950	"
	p.p. pilastro		=	3000	"
				61420	Kg.

PILASTRO 25

<u>Terrazzo</u> :	T ₂₄₋₂₅ :	I225x2	=	2450	Kg.
	"	3330x2	=	6660	"
	T ₂₅₋₂₆ :	I225x2.30	=	2820	"
	"	2530x2.30	=	5800	"
	T ₂₅₋₃₄ :	II55x2.10	=	2420	"
<u>Piani</u> :	T ₂₄₋₂₅ :	3490x2x3	=	21000	"
	T ₂₅₋₂₆ :	2350x2,3x3	=	16200	"
	T ₂₅₋₃₄ :	I885x2.10x3	=	11850	"
					69200 Kg.

PILASTRO 26

<u>Terrazzo</u> :	T ₂₅₋₂₆ :	I225x2	=	2450	"
	"	2530x2	=	5060	"
	T _{I7-26} :	I320xI,25	=	1650	"
	"	400xI,75	=	700	"
	T ₂₆₋₂₇ :	II55x0,80	=	925	"
<u>Piani</u> :	T ₂₅₋₂₆ :	2350x2x3	=	14100	"
	T _{I7-26} :	I320xI.25x3	=	5000	"
	T ₂₆₋₂₇ :	I885x0.80x3	=	4500	"
	p.p. pilastro		=	3000	"
					37.385 Kg.

PILASTRO 27

<u>Terrazzo</u> :	T ₂₆₋₂₇ : 1155 x 0.90	= 1050 Kg.
	T ₂₇₋₂₈ : 2500 x 1.60	= 4000 "
<u>Piani</u> :	T ₂₆₋₂₇ : 1885 x 0.90 x 3	= 5100 "
	T ₂₇₋₂₈ : 3125 x 1.43 x 3	= 13500 "
	p.p. pilastro	= 3000 "
		26650 Kg.

PILASTRO 28

<u>Terrazzo</u> :	T ₂₇₋₂₈₋₂₉ : 2500 x 2.80	7000 Kg.
<u>Piani</u> :	" : 3125 x 2.80 x 3	26200 "
	p.p. pilastro	3000 "
		36200 Kg.

PILASTRO 29

<u>Terrazzo</u> :	T ₂₈₋₂₉ : 2500 x 2.00	5000 Kg.
	T ₂₉₋₁₉ : 1155 x 2.40	2800 "
<u>Piani</u> :	T ₂₈₋₂₉ : 3125 x 1.10 x 3	10300 "
	T ₂₉₋₁₉ : 3885 x 2.13 x 3	25000 "
	p.p. pilastro :	3000 "
		46100 Kg.

PILASTRO 30

<u>Terrazzo</u> :	T_{2I-30} : 1155x2,30	= 2660 Kg.
	T_{30-3I} : 2500x2,30	= 5750 "
<u>Piani</u> :	T_{2I-30} : 1885x2,10x3	= 12000 "
	T_{30-3I} : 2980x2,10x3	= 18800 "
	p.p. pilastro	= 3000 "
		42210 Kg.

PILASTRO 31

<u>Terrazzo</u> :	$T_{30-3I-32}$: 2500x4,42	= 11000 Kg.
<u>Piani</u> :	" : 2980x4,42x3	= 39500 "
	p.p. pilastro :	= 3000 "
		53.500 Kg.

PILASTRO 32

<u>Terrazzo</u> :	$T_{3I-32-33}$: 2500x3,53	= 8900 Kg.
<u>Piani</u> :	" : 2980x3,53x3	= 31600 "
	p.p. pilastro :	= 3000 "
		43500 Kg.

FONDAZIONE I-2-3-4

Pilastro	I	34160	Kg.
"	2	43900	"
"	3	52150	"
"	4	46600	"
		176810	Kg.

per m : 176810/1365 13000 Kg/m

p.p. fondazione

 5000 "
18000 Kg/m

B = 180 cm. $0,30 \times 1,80 \times 2500 = 1350$

$\sigma_t = 1,00 \text{ Kg/cm}^2$ $0,40 \times 1,20 \times 2500 = 1200$
 $1,20 \times 1,40 \times 1600 = 2700$

5250 Kg/m

$M = 10000 \times 0,70^2 / 2 = 2450 \text{ Kgm.}$

H = 40 cm. $\sigma_c = 30 \text{ Kg/cm}^2$

h = 36 cm. $\sigma_f = 1400$ "

b = 100 cm.

$A_f = 5,15 \text{ cm}^2/\text{m}$ I ϕ 12 alt. I ϕ 14 ogni 25 cm.

FONDAZIONE 5-6 - 7-8 -

Pilastro	5	48400	Kg.
"	6	51200	"
"	7	40500	"
"	8	45400	"

185500 Kg.



per m :	185500/13.65	13.600	Kg/m
p.p. fond.		5.200	"
		18800	Kg/m

$$B = 190 \text{ cm.}$$

$$\sigma_t = 18800/19000 = 1 \text{ Kg/cm}^2$$

A L A

$$M = 10000 \times 0,75^2 / 2 = 2800 \text{ Kgm.}$$

$$H = 40 \text{ cm.}$$

$$b = 100 \text{ cm.} \quad A_f = 5.90 \text{ cm}^2/\text{m} \quad 4 \phi 14/\text{m}$$

$$\tau = (10000 \times 0,75) / 100 \times 33 = 2,27 \text{ Kg/cm}^2$$

FONDAZIONE 9-10-11-12

Pilastro	9	46600	Kg.
"	10	58900	"
"	11	41250	"
"	12	23800	"
		170550	Kg.
p.p. fondaz.		60000	"
		230550	Kg.

$$A_f = 23.055 \text{ m}^2$$

$$L = 12.05 \text{ m.}$$

$$B = 23.055/12.05 = 1.90 \text{ m.}$$

A L A come preced.

FONDAZIONE I3 -I4

Pilastro I3	35180 Kg.
" I4	31250 "
	65430 Kg.
p.p. fondaz.	24000 "
	90430 Kg.

$$A_{fn} = 9.04 \text{ m}^2$$

$$L = 6 \text{ m.}$$

$$B = 1.50 \text{ m.}$$

$$\sigma_t = 1 \text{ Kg/cm}^2$$

A L A

$$M = 10000 \times 55^2/2$$

$$1500 \text{ Kg.m.}$$

$$\sigma_c < 30 \text{ Kg/cm}^2$$

$$\sigma_f = 1400 \text{ Kg/cm}^2$$

$$A_f = 3.12 \text{ cm}^2/\text{m}$$

$$4 \phi 10/\text{m}$$

FONDAZIONE I5-I6-I7-I8-I9-20

Pilastro I5	30400 Kg.
" I6	71000 "
" I7	68800 "
" I8	36900 "
" I9	51000 "
" 20	
	22900 "
	281400 Kg.



p.p. fondaz.

100.000 Kg.

381.400 Kg.

$$L = 17 \text{ m.}$$

$$B = 2,30 \text{ m.}$$

$$\sigma = 1 \text{ Kg/cm}^2$$

A L A

$$M = 10000 \times 0,95^2 / 2 = 4500 \text{ Kgm.}$$

$$A_f = 9.70 \text{ cm}^2/\text{m} \quad 36/1400$$

$$5 \phi 16/\text{m}$$

$$\tau = 9500 / 100 \times 33 = 2,88 \text{ Kg/cm}^2$$

FONDAZIONE 21-22-23-24-25-26

PILASTRO	21	51.600	Kg.
	22	53.000	"
	23	43.000	"
	24	61.400	"
	25	69.000	"
	26	37.400	"
		315.400	Kg.
muratura p.terra		22.000	"
		337.400	Kg.
pp. fondazione		118.000	"
		455.400	Kg.



$$L = 21.85 \text{ m.}$$

$$B = 2.10 \text{ m.} \quad \sigma_t \quad 1 \text{ Kg/cm}^2$$

A L A

$$M = 10000 \times 0.85^2 / 2 = 3600 \text{ Kgm.}$$

32/1400

$$A_f = 7.60 \text{ cm}^2/\text{m} \quad 4 \phi 16/\text{m}$$

FONDAZIONE 27-28-29

Pilastro	27	26.650	Kg.
"	28	36.200	"
"	29	46.100	"
		108.950	Kg.
p.p. fondaz.		39.000	"
		147.950	Kg.

$$A_{fn} = 14.795 \text{ m}^2$$

$$L = 7.40 \text{ m.}$$

Si divide l'area in due zone

con $B = 2.30$ quella 28-29

e $B = 1.60$ " 27-28

$$1.60 \times 3.75 + 2.30 \times 3.95 = 15.10 \text{ m}^2$$

A L A

1) $B = 2.30 \text{ m}$ come 15-16 etcc.

2) $B = 1.60 \text{ m.}$

$$M = 10000 \times 0.60^2 / 2 = 1800 \text{ Kgm.}$$



$$A_f = 3,74 \text{ cm}^2/\text{m}$$

$$4 \text{ } \phi \text{ 12/m}$$

FONDAZIONE 30-31-32-33-34

PILASTRO	30	42.210	Kg/m
"	31	51.000	"
"	32	43.500	"
"	33	43.200	"
"	34	41.040	"

220.950 Kg/m

$$\text{per m } 220.950/17,70 =$$

$$12.500 \text{ Kg/m}$$

$$\text{muratura p.terra: } 470 \times 2,5$$

$$1.170 \text{ "}$$

$$13.670 \text{ Kg/m}$$

$$\text{p.p. fondaz.}$$

$$5.200 \text{ "}$$

$$18.870 \text{ Kg/m}$$

$$B = 190 \text{ cm.}$$

$$\sigma_t = 1 \text{ Kg/cm}^2$$

A L A

Come analoghe precedenti

ARMATURA DELLE TRAVI DI FONDAZIONEFondazione I-2-3-4

$$q_n = 13000 \text{ Kg/m}$$

$$M_{I-2} = 13000 \times 3,60^2 \times 0,091 = 16000 \text{ Kgm.}$$

$$H = 160 \text{ cm.}$$

$$\sigma_c < 30 - \text{Kg/cm}^2$$

$$h = 155 \text{ cm.}$$

$$\sigma_f = 1400 \text{ "}$$

$$b = 40 \text{ cm.}$$

$$A_f = 8 \text{ cm}^2 : 3 \phi 14 \text{ d} + 2 \phi 16 \text{ p} = 8,64 \text{ cm}^2$$

$$M_{2-3} = 13000 \times 4,05^2 \times 0,0715 = 16000 \text{ Kgm.}$$

$$A_f = 8 \text{ cm}^2 \text{ come preced.}$$

$$M_4 = 13000 \times 1,35^2 / 2 = 11800 \text{ Kgm.}$$

$$A_f = 5,9 \text{ cm}^2 : 3 \phi 12 + 2 \phi 18$$

$$M_{3-4} = 13000 \times 4,10^2 \times 0,091 = 20000 \text{ Kgm.}$$

$$A_f = 10 \text{ cm}^2 : 3 \phi 16 \text{ d} + 2 \phi 16 \text{ p.}$$

$$\tau_{mx} = 24700 / 40 \times 140 = 4,40 \text{ Kg/cm}^2.$$

FONDAZIONE 5-6-7-8

$$q_n = 13600 \text{ Kg/m}$$

$$M_{5-6} = 13600 \times 5,20^2 \times 0,091 = 33500 \text{ Kgm.}$$

$$\sigma_c / \sigma_f = 36 / 1400$$

$$A_f = 16,80 \text{ cm}^2 : 3 \phi 18_d + 4 \phi 18_p$$

$$\tau = 33000 / 40 \times 140 = 5,90 \text{ Kg/cm}^2$$

$$S = 33000 \times 242 / 2 \times 140 = 28600 \text{ Kg.}$$

$$4 \phi 18_p \text{ a } 30^\circ : 10,18 \times 1,366 \times 1400 = 19500 \text{ Kg.}$$

Si staffa con $\phi 8$ ogni 20 cm.

$$M_{6-7} = 13600 \times 3,20^2 \times 0,067 = 9300 \text{ Kgm.}$$

$$A_f = 4,70 \text{ cm}^2 : 3 \phi 14$$

$$M_{7-8} = 13600 \times 3,35^2 \times 0,0834 = 12800 \text{ Kgm.}$$

$$A_f = 6,40 \text{ cm}^2 : 3 \phi 18$$

$$M_8 = 13600 \times 1,35^2 / 2 = 12300 \text{ Kgm.}$$

$$A_f = 6,15 \text{ cm}^2 : 3 \phi 12 + 2 \phi 14$$

$$M_6 = 13600 \times (140 + 33) / 9 \times 8,40 = 31200 \text{ Kgm.}$$

$$A_f = 15,60 \text{ cm}^2 : 3 \phi 14 + 5 \phi 18$$

FONDAZIONE 9-10-II-12

$$q_n = 14000 \text{ Kg/m}$$

$$M_{9-10} = 14000 \times 4,30^2 \times 0,091 = 23600 \text{ Kgm.}$$

$$A_f = 12 \text{ cm}^2 \quad 5 \phi 18$$

$$M_{10-II} = 14000 \times 2,75^2 \times 0,071 = 7600 \text{ Kgm.}$$

$$A_f = 3,80 \text{ cm}^2 \quad 3 \phi 14$$

$$M_{II-12} = 14000 \times 3,20^2 \times 0,091 = 13000 \text{ Kgm.}$$

$$A_f = 6,50 \text{ cm}^2 \quad 3 \phi 18$$

TRAVE 13 -14

$$q_n = 11.100 \text{ Kg/m}$$

$$M = 11100 \times 4,50^2 \times 0,100 = 22500 \text{ Kgm.}$$

$$A_f = 11,25 \text{ cm}^2 : 3 \phi 16 \text{ d} + 4 \phi 14 \text{ p.}$$

$$\tau = 23400/40 \times 140 = 4,20 \text{ Kg/cm}^2$$

FONDAZIONE I5-I6-I7-I8-I9-20

$$q_n = 16500 \text{ Kg/m}$$

$$M_{I5-I6} = 16500 \times 3.25^2 \times 0.091 = 15800 \text{ Kgm.}$$

$$A_f = 8 \text{ cm}^2 \quad 3 \phi I6 \text{ d} + 2 \phi I6 \text{ p.}$$

$$M_{I6-I7} = 16500 \times 5.15^2 \times 0.0834 = 36500 \text{ Kgm.}$$

$$A_f = 18.25 \text{ cm}^2 \quad 8 \phi I8 \quad 38/I400$$

$$\tau = 39300 / 40 \times I40 = 7 \text{ Kg/cm}^2$$

$$S = 39300 \times 237 / 280 = 33300 \text{ Kg.}$$

$$4 \phi I8 \phi I0, I8 \times I400 \times I,366 = 19400 \text{ Kg.}$$

Si staffa con $\phi 8/20 \text{ cm.}$

$$M_{I7-I8} = 16500 \times 2.85^2 \times 0.071 = 10000 \text{ Kgm.}$$

A-I8

$$A_f = 5 \text{ cm}^2 \quad 3 \phi I6$$

$$M_{20} = 16500 \times 1.35^2 / 2 = 15000 \text{ Kgm.}$$

$$A_f = 7.5 \text{ cm}^2 : 3 \phi I8$$

FONDAZIONE 21-22

$$q_n = 14500 \text{ Kg/m}$$

$$M_{21-22} = 14500 \times 4.50^2 \times 0.091 = 26500 \text{ Kgm.}$$

$$A_f = 13.25 \text{ cm}^2 \quad 3 \phi 16 \text{ d} + 4 \phi 16 \text{ p} \quad \sigma_c / \sigma_f = 32/1400$$

$$M_{22-23} = 14500 \times 4.30^2 \times 0.0875 = 22400 \text{ Kgm.}$$

24-25

$$A_f = 11.20 \text{ cm}^2 : 3 \phi 16 \text{ d} + 4 \phi 14 \text{ p.}$$

$$M_{25-26} = 14500 \times 4.20^2 \times 0.091 = 23500 \text{ Kgm.}$$

$$A_f = 12 \text{ cm}^2 : 3 \phi 16 \text{ d} + 4 \phi 14 \text{ p.}$$

$$\tau_{mx} = 30000/5600 = 5.35 \text{ Kg/cm}^2$$

$$S = 30000 \times 205/280 = 22000 \text{ Kg.}$$

$$4 \phi 16 : 8.04 \times 1.366 \times 1400 = 15500 \text{ Kg.}$$

Staffe $\phi 8/20$:

FONDAZIONE 30-31-32

$$q_n = 12500 \text{ Kg/m}$$

$$M_{30-31} = 12500 \times 4.50^2 \times 0.091 = 21000 \text{ Kgm.}$$

$$A_f = 10.50 \text{ cm}^2 \quad 3 \phi 14 \text{ d} + 4 \phi 14 \text{ p.}$$

$$M_{31-32} = 12500 \times 4.35^2 \times 0.0834 = 19700 \text{ Kgm.}$$



$$A_f = 2,85 \text{ cm}^2 \quad id$$

$$M_{33-34} = 12500 \times 4,25^2 \times 0.09I = 20500 \text{ Kgm.}$$

$$A_f = 10.25 \text{ cm}^2 \quad id$$

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