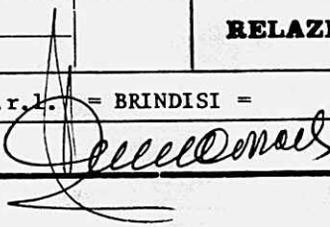


7

DISEGN.	DATA 2/77	SIGLA	PROGETTO N.	1	STUDIO TECNICO Ing. Antonio E. Corrado Brindisi - Corso Roma, 99 - Tel. 22085 - 27483
CONTR.					
VISTO:					
VERIFICARE MISURE E QUOTE					Legge 14.2.1963- P.I. n°1312
COMMITTENTE GESCAL Lotti "C-D" S. Elia =BRINDISI=					PROGETTO DELLE STRUTTURE
SOSTITUISCE IL N.					
SOSTITUITO DAL N.					RELAZIONE DI CALCOLO
IL COMMITTENTE: EDILCO s.r.l. = BRINDISI =					
IL PROGETTISTA: 					

RELAZIONE DI CALCOLO

I fabbricati in progetto hanno strutture portanti costituite da telai elastici longitudinali su cui scarseano trasversalmente i solai misti latero-side no-cementizi.

Le travi dei telai sono state calcolate, col metodo del Kani, come continue sui ritzi: in esse le sollecitazioni unitarie nei materiali sono state tenute nei limiti consentiti dalla normativa vigente in funzione della resistenza caratteristica dei materiali adottati: calcestruzzo cementizio con $R_{ck} 300 \text{ kg/cm}^2$ ed acciaio ad aderenza migliorata del tipo FeB44k o tipo FeB38k, contr. -

Per le armature dei pilastri e staffe di travi e pilastri è previsto l'uso di acciaio liscio del tipo FeB32k. -

Nei calcoli sono state tenute in conto le prescrizioni regolamentari di cui al D.M. 16.6.76 ai sensi della legge 5.11.71 n° 1086. -

ANALISI DEI CARICHI UNITARI

1) SOLAI MISTI LATERO-CEMENTIZI H 204:

p. pz.	162 kgm^{-2}
solette	88 ✓
pann. + inc. tram.	200 ✓
sovr. acc.	<u>250 ✓</u>
Somm.	700 kgm^{-2}

2) MURATURA DI TOMPAGNO A DOPPIA FODERA:
(pu H = 3,00 m.) 800 kgm^{-2}

3) SBALZI MISTI LATERO-CEMENTIZI H 204:

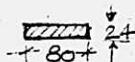
p. pz.	260 kgm^{-2}
solette	100 ✓
sovr. perm.	140 ✓
sovr. accid.	<u>400 ✓</u>
Somm	900 kgm^{-2}

4) SCALE IN C.A. A SBALZO DA TRAVI A GIOCCO:

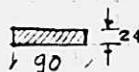
p. pz.	306 kgm^{-2}
sovr. perm.	194 ✓
sovr. accid.	<u>400 ✓</u>
	900 kgm^{-2}

FABBR. ART. SCALX "A"

	①		②		③		④
	⑧		⑦		⑥		⑤
M	6900	3500	5300	1500	3900	2400	4700
τ	0,237						
σ_f	2000	2200	2200		2200	2200	2200
σ_c	92	78	88		82	60	84
Δ_c	17,37	8,19	12,18		8,71	5,13	10,41
Δ_f	13,90	-	7,31		-	-	4,16



	⑨		⑩		⑪		⑫
	⑬		⑮		⑭		⑯
M	8600	4300	5700	1000	4400	3300	6600
τ	0,225	0,318	0,276		0,315	0,363	0,257
σ_f	2000	2200	2200		2200	2200	2200
σ_c	92	90	90		92	69	86
Δ_c	21,54	9,70	13,14	2,21	10,00	7,41	14,92
Δ_f	21,54	-	5,26	-	-	-	14,92

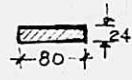


	⑰		⑱		⑲		⑳		㉑		㉒		㉓
M	6800	2400	4500	1600	6200	5200	9200						
τ					0,250	0,273	0,217						
σ_f	2000	2200	2200		2000	2000	1800						
σ_c	92	72	94		88	86	90						
Δ_c	17,37	8,19	10,30		15,69	13,03	23,10						
Δ_f	13,90	-	4,12		12,55	5,21	23,10						

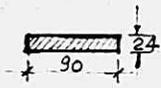


FABBRICATO ART. SCALA 'B'

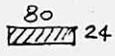
	①		②		③		④
	⑧		⑦		⑥		⑤
M	8800	4400	6200	1000	3600	2400	4700
α	0,210						
σ_f	1800	2200	2000		2200	2200	2200
σ_c	92	82	88		78	60	84
A_f	24,58	9,94	15,69	2,21	8,19	5,13	10,41
A'_f	24,58	3,98	12,55	-	-	-	4,16



	⑨		⑩		⑪		⑫
	⑬		⑮		⑭		⑯
M	10900	5500	6300	1000	3800	3200	6400
α	0,200	0,281	0,251		0,338		0,261
σ_f	1800	2200	2200		2200	2200	2200
σ_c	96	88	88		76	69	88
A_f	30,58	12,63	15,66		8,68	7,41	14,54
A'_f	30,58	5,05	15,66		-	-	11,63



	⑰		⑱		⑲		⑳		㉑		㉒		㉓
M	9300	4700	5800	150	5800	4700	9300	4700	5800	150	5800	4700	9300
α	0,204		0,258										
σ_f	1800	2200	2200		2200	2200							
σ_c	94	84	90		90	84							
A_f	25,94	10,41	13,37		13,37	10,41		25,94					
A'_f	25,94	4,16	10,70		10,70	4,16		25,94					



#ABBL. ART. SCALA C_n

	① 8		② 7		③ 6
M	7200	3600	4100	1000	3300
τ	0,232	0,326	0,307	0,622	0,342
σ_f	2000	2200	2200	2200	2200
σ_c	90	78	80	38	74
A_f	18,10	8,19	9,37	2,21	7,45
A'_f	18,10	-	3,75	-	-

	⑨ 16		⑩ 15		⑪ 14
M	7200	3600	4100	1000	3500
τ	0,246	0,348	0,326		0,353
σ_f	2200	2200	2200		2200
σ_c	90	72	74		70
A_f	16,40	8,04	9,21	2,21	7,89
A'_f	16,40	-	3,69	-	1,58

	⑬ 20		⑭ 18		⑮ 19		⑯ 20
M	7600	3800	4400	-10	5400	4500	3000
τ	0,225	0,319	0,297		0,268	0,293	0,207
σ_f	2000	2200	2200		2200	2200	1800
σ_c	92	82	82		88	84	94
A_f	19,10	8,71	9,94		12,18	10,30	25,51
A'_f	19,10	-	3,98		7,31	4,12	25,51

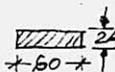


LINE A

	①		④		⑦		⑩
		5,50		3,20		4,10	
M	8897	4448	5800	239	3787	3171	6343
v	0,221	0,313	0,274		0,339	0,371	0,252
α_c	1600	2200	2200		2200	2200	2200
σ_c	82	82	82		76	68	80
A_f	27,89	10,06	13,26		8,67	7,17	15,75
A_f	27,89	-	13,26		-	-	15,75

	2		5		8		11
		5,50		3,40		4,20	
M	11194	5597	7104	198	3860	3335	6665
v	0,197	0,279	0,248		0,336	0,361	0,256
α_c	1800	2200	1800		2200	2200	1900
σ_c	84	82	84		76	70	80
A_f	40,87	12,62	20,02		8,75	7,54	18,39
A_f	40,87	12,62	18,02		-	-	14,71

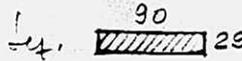
LINEA

	①		②		③	
		5,20		3,50		
M	3259	1630	2268	428	857	
z	0,299	0,422	0,358	0,824	0,582	
σ_f	2200	2200	2200	2200	2200	
σ_b	88	56	70	28	40	
σ_f'	7,49	4,02	5,08	0,93	1,86	

		③		⑥		⑨		⑬		⑱		⑳		㉒
		5,50		3,10		5,50		5,50		3,10		5,50		9425
M	9642	4731	5274	-1125	7137	6233	12385	6233	7137	-1125	5274	4731	9425	
z	0,213	0,303	0,287	0,622	0,247	0,264	0,187							
σ_c	1600	2200	2200	2200	1800	2000	1400							
σ_b	86	82	80	38	82	80	88							
σ_f	30,80	10,64	11,86	2,148	20,45	15,61	45,77							
σ_f'	30,80	2,13	7,11	-	20,45	15,61	45,77							

CALDESTIO ATTICO

TRAVE 1-2-3-4
8-7-6-5



LOTTO ¹⁰ARTICOLATI
SCALA "A"

$h = 26 \text{ cm.}$

Analisi dei carichi

Solai $0,5 \times 4,00 \times 705 = 1410$

carico cono $0,5 \times 1600 = 800$

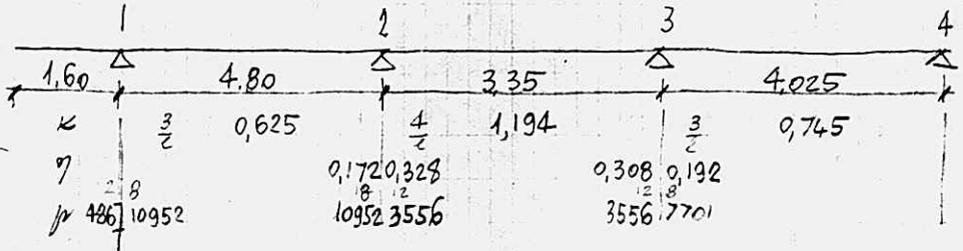
sbalzo $0,90 \times 800 = 720$

p. pz. 653

conc. velette 190

2 ngh. 30

3803 kg/m



+10952	+10952	+7396	-3556	+3556	-4145	-7701
-1272	-1272	-2426	-2426	+2223	+1262	+1262
-1620	-1620	-3090	-3090	+2228	+1389	+1389
-1655	-1655	-3157	-3157	+2249	+1402	+1402
-1659	-1659	-3164	-3164	+2251	+1403	+1403
-1659	-1659	-3164	-3164	4894	4895	4895
7624	7624	7633	7633			

T	7537	10718	7188		5552	8870	6437
M	4867	7468	7634	-841	4895	5449	3423
v	0,354	0,285	0,282		0,353	0,334	0,422
σ_f	2200	2200	2200		2200	2200	2200
σ_b	72	82	82		72	76	58
k_f	9,36	14,57	14,73		9,38	10,40	6,43
k_f	-	11,65	11,78		-	-	-

TRAVE 9-10-11-12
16-15-14-13

sez.  90x29

ALPESTIO ATTICO

LOTTO "C" ARTICOLATO

SCALA "A"

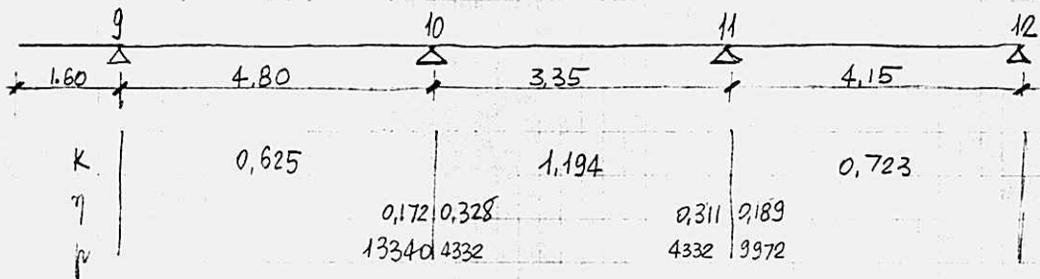
Analisi carichi

solaino $0,5(4,00+2,75) \times 705 = 2379$

c.a.c.c. = 1600

p.p. = 653

4632



+13340	9008	-4332	+4332	-9972
-1687	3008	-3217	+2755	+1674
-2023	3008	-3858	+2954	+1795
-2057	3008	-3924	+2974	+1808
-2061	3008	-3930	+2976	+1809
-2061	3008	-3931		
+9218	9218	9218	6353	6354

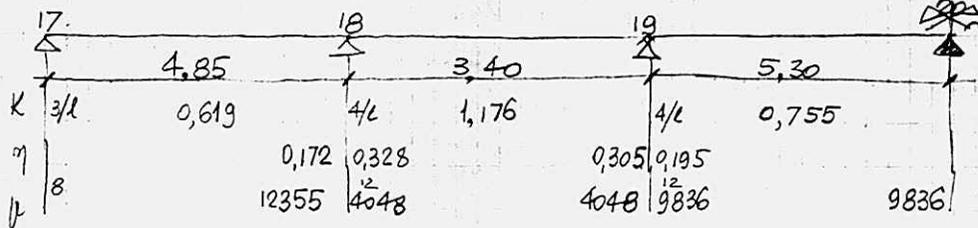
T	9196	13037	8614	6904	11142	8080	
M	5929	9128	9218	-1208	6354	7047	4432
v	0,320	0,258	0,257		0,309	0,294	0,371
σ _f	2200	2000	2000		2200		2200
σ _b	80	82	82		82	82	68
A _f	11,36	19,42	19,52		12,33	13,73	8,48
A' _f	-	19,42	19,52		2,47	8,24	-

ALPESIO ATTICO
 LOTTO 'C', RETICOLATO
 SCALA 'A.'

TRAVE 17-18-19-20-21-22-23 seq. 190x29

Analisi di carichi:

Solaio $0,5 \times 2,75 \times 705 = 969$
 carico conc. $0,5 \times 1600 = 800$
 sbalzo $1,95 \times 800 = 1560$
 p. p. = 653
 conc. reietta = 190
 ringhiera = 30
Sommario = 4202



+12355	+3307	-4048	+4048	-5788	-9836	+9836
-1429	0	-2725	+2594	0	+1660	
-1875		-3576	+2856		+1826	
-1920		-3662	+2882		+1824	
-1925		-3670	+2885		+1844	
-1925		-3671	+2885		+1844	
+8505	-8505		+6147	-6148		11680

T	8436		11943 17837		6450 10091		12179
M	5491	8468	8505	-1196	6147	5969	11680
v	0,333	0,266	0,267		0,285	0,319	0,228
σ_f	2200	2000	2000		2200	2200	1600
σ_b	78	82	82		82	80	82
Δ_f	10,69	18,02	18,06		11,83	11,40	31,01
Δ_f'	-	14,41	14,45		-	-	31,01

CALDESTIO ATTICO

LOTTO 'C. ARTICOLATO

SCALA 'C.

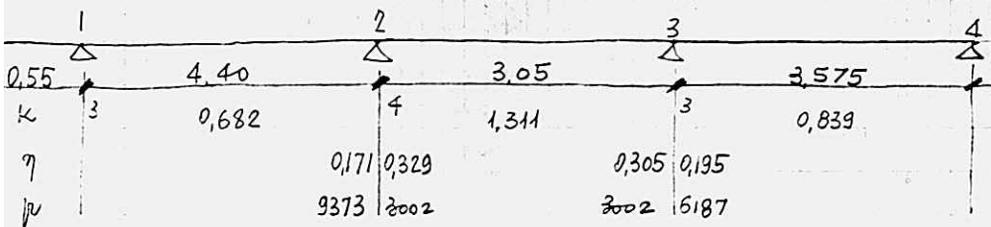
RAVE. 1.2.3.4
8.7.6.5

SEZ. 90x29

$h = 26$

ANALISI DEI CARICHI:

Solaio	$0,5 \times 4,2 \times 705$	=	1480
carica conc.	$0,5 \times 1600$	=	800
sbalzo	$0,9 \times 800$	=	720
p. p.			653
conc. v. l. c.			190
ringhiera			30
			3873



+9373	+6371	-3002	+3002	-3185	-6187
-1089	-2096	+1611	+1029		
-1365	-2626	+1772	+1133		
-1393	-2679	+1786	+1143		
-1395	-2684	+1790	+1144		
-1395	-2684	+1790	+1145		
+6583	-6580	+3898	-3897		

T 7025	10016	6753	5069	8041	5804
M 4166	6371	6580	-1002	3998	4349
z 0,342	0,309	0,304	0,300	0,374	0,470
α ₁ 2200	2200	2200	2200	2200	2200
α ₂ 66	82	82	64	66	53
A ₁ 7,99	12,35	12,57	7,61	8,17	5,21
A ₂ -	2,47	2,51	-	-	-

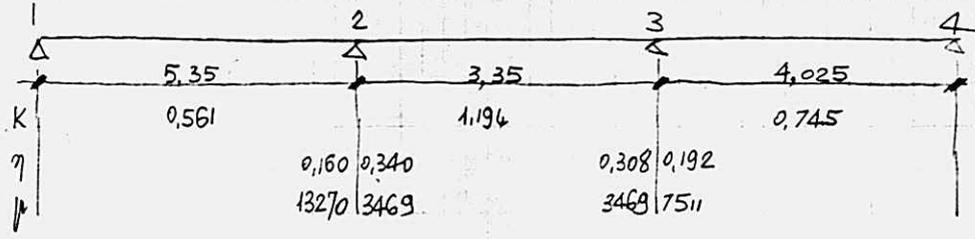
CALPESTIO ATTICO

TRAVE $\frac{1-2-3-4}{8-7-6-5}$  90x24

LOTTO "C" ARTICOLATO
SCALA "B"

ANALISI DEI CARICHI

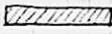
- solaino $0,5 \times 4,3 \times 705 = 1516$
- canco conc. $0,5 \times 1600 = 800$
- stalgo $0,65 \times 800 = 520$
- p. pr. = 653
- conc. relett. = 190
- n.ugh. = 30
- 3709



+ 13270	+ 9801	- 3469	+ 3469	- 4442	- 7511
- 1568		- 3332	+ 2271		+ 1416
- 1932		- 4105	+ 2509		+ 1564
- 1970		- 4185	+ 2534		+ 1580
- 1974		- 4194	+ 2537		+ 1581
- 1974		- 4195	+ 2537		+ 1581
+ 9322		9322	+ 4248		- 4349

T	8179	11664	7697	4727	8545	6384	
M	5898	9018	9322	-1336	4348	5495	3338
	0,221	0,260	0,256		0,374	0,333	0,427
	2200	2000	2000		2200	2200	2200
	80	82	82		66	76	58
	11,33	19,31	19,63		8,17	10,44	6,35
	-	19,31	19,63		-	-	-

TRAVE 17-18-19-20-21-22-23

sez  90x24

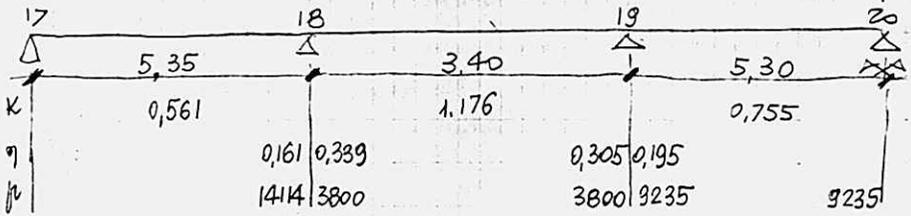
CALPESTIO ATTICO

LOTTO "C" ARTICOLATO

SCALA "B."

ANALISI DEI CARICHI

solaio	$0,5 \times 2,70 \times 705 =$	952	kg m ¹
carico conc.	$0,5 \times 1600 =$	800	v
sbalzo	$1,65 \times 800 =$	1320	v
p. pr.	=	653	v
conc. retta	=	190	v
ringhiera	=	30	v
tot.		3945	kg m¹



	+14144	+10314	-3800	+3800	-5435	-9235	+9235
	-1660	0	-3486	+2724	0	+1742	
	-2099		-4420	+3006		+1922	
	-2144		-4515	+3035		+1940	
	-2149		-4525	+3038		+1942	
	-2150		-4526	+3038		+1942	
	+9814	-9814		+5350	-5351		11177

T	8718	12388	12019		5393	9355	11554
M	6273	3633	9814	-1664	5350	5742	11177
	0,311	0,251	0,249		0,337	0,325	0,233
	2200	1800	1800		2200	2200	1600
	82	82	80		76	80	80
	11,95	22,71	23,30		10,30	11,18	20,34
	-	18,17	23,30		-	-	20,34

TRAVE 9.10.11.12
16.15.14.13

SEZ. 90x29

CALPESTIO ATTICO

LOTTO C, ARTICOLATO
SCALA "C,"

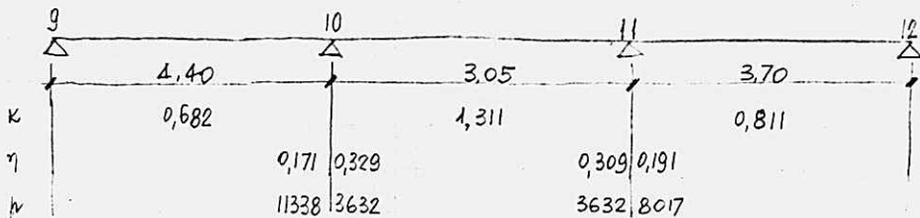
ANALISI DEI CARICHI

SOLAI $0,5(4,20+2,70) \times 705 = 2432$

CARICO CONC. 1600

P. PROPRIO 653

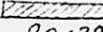
4.685



+11338	+7706	-2632	+3632	-8017
-1318	-2535	+2138	+1322	
-1683	-3239	+2356	+1456	
-1721	-3310	+2378	+1479	
-1724	-3318	+2380	+1471	
-1725	-3318	+2380	+1471	
7888	-7888	5074	5075	

T	8514	12100	8067	6222	10039	7296	
M	5039	7736	7888	-942	5075	5681	3564
e	0,347	0,280	0,278		0,346	0,327	0,413
α _a	2200	2200	2200		2200	2200	2200
α _b	74	82	82		74	78	60
A _f	9,76	16,63	16,79		9,79	10,87	6,77
A _{f'}	-	9,95	10,07		-	-	-

TRAVE 9.10.11.12
16.15.14.13

sez.  90x29

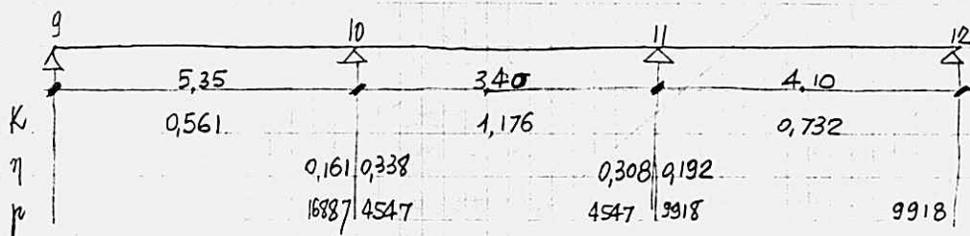
CLDESTIO ATTICO

LOTTO "C. ARICOLATO
SCALA "C."

ANALISI DEI CARICHI

per la camp. 9-10: $\frac{2468+800}{653}$

solco: $0.5(4.30+2.70)705 = 2468$	
carica conc	= 1600
p. m.	653
	4720



+16887	+12310	-4547	+4547	-5371	-9918
-1987	0	-4171	+2939	0	+1832
-2460		-5164	+3245		+2023
-2509		-5268	+3277		+2043
-2515		-5278	+3280		+2045
-2515		-5280	+3280		+2045
11857		11827	5827		5828

T	10410	14840	9797		6251	11097		8255
M	7505	11479	11857	-1689	5828	7217		4408
	0.285	0.230	0.227		0.323	0.290		0.312
	2200	1600	1600		2200	2200		2200
	82	40	82		80	82		68
	1460	30.75	32.20		11.26	13.89		8.45
	11.68	30.75	32.20		-	8.34		-

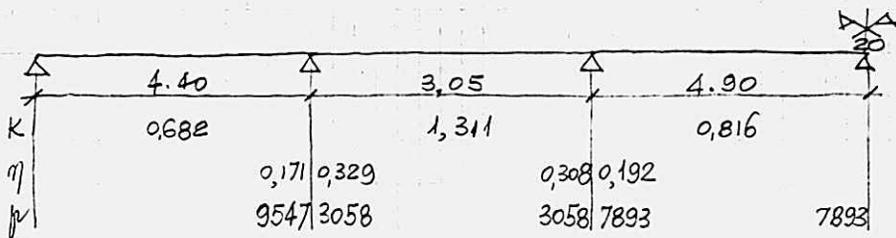
TRAVE 17.18.19.20.21.22.23

sez.  30x29

CALPESTIO ATTICO
LOTTO C_n RETICOLATO
SCALA C_n

ANALISI DEI CARICHI

SOLLIO $0,5 \times 2,7 \times 705 = 952 \text{ Kg m}^{-1}$
 CARICO CONC. $0,5 \times 600 = 800 \checkmark$
 SBALZO $1,65 \times 800 = 1320 \checkmark$
 P. PROP. = 653 \checkmark
 CONC. VELETTA = 190 \checkmark
 RINGH. = $\frac{30}{\dots}$
 3945 Kg m^{-1}



	+9547	0	+6489	0	3058	3058	0	-4835	0	-7893	7893
	-1110	1	9	2	-2135	+2147	8	2	+338		
	-1477				-2841	+2364			+1474		
	-1514				-2913	+2386			+1488		
	-1518				-2920	+2389			+1489		
	-1518				-2921	+2389			+1489		
	+6511				-6511	+4915			-4915		+9382

7199		10159	6539		5493	8754		10577
4243	6568	6511	-1092	4915	4797	9382		
0379	0306	0306		0352	0356	0255		
2200	2200	2200		2200	2200	2000		
66	78	78		72	72	82		
8,07	13,66	13,66		9,40	9,29	19,69		
-	2,73	2,73		-	-	19,69		

ALPESTIO ATTICO

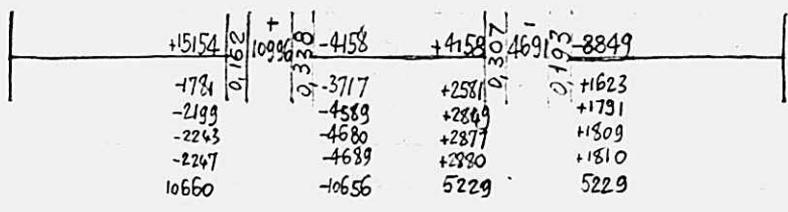
TRAVE 1-4-7-10 ac_2 90x29  h = 26
 22-19-16-15

Analisi carichi:

- Solaio $0,5 \times 5,03 \times 705 = 1773$
- Cance conc. $0,5 \times 1900 = 950$
- Scalzi $0,9 \times 800 = 720$
- p. pz. $= 653$
- $P = 4096$
- Conc. rickh $0,8 \times 0,95 \times 2500 = 190$
- Inghr. $= 30$

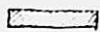
$q = 4316 \text{ kg/m}$

	①	5,30	④	3,40	⑦	4,05	⑩
κ		$\frac{3}{4}$ 0,565		$\frac{1}{2}$ 1,176		$\frac{1}{3}$ 0,74	
q_f			-0,162	0,338		0,307	0,193
y	0		15154	4158	12	4158	8849



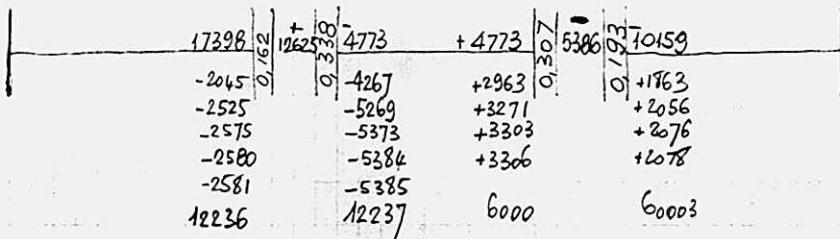
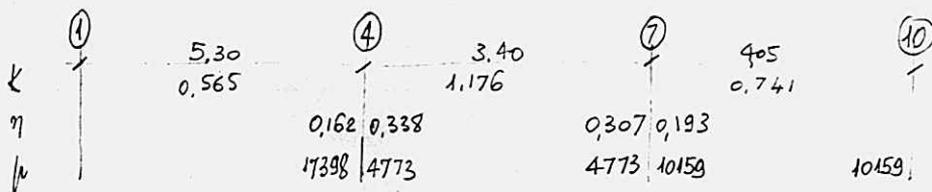
T	9426	13649	8935	5742	10031	7449	
M	6735	10293	10660	-1411	5229	6428	3932
τ	0,200	0,243	0,239		0,341	0,308	0,393
σ_f	2200	1600	1800		2200	2000	2200
σ_b	82	80	82		74	82	64
k_f	13,07	27,59	2500		9,94	13,82	7,55
k_p	5,22	22,08	2500		-	-	-
		6,38					

TRAVE 2.5.8.11
23-20-17-14

sez  90x29 h=26

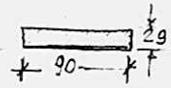
Analisi carichi:

$$\begin{aligned} \text{solai} & 0,5(3,85+2,95)705 = 2397 \\ \text{carico conc.} & = 1900 \\ \text{p.m.} & = \frac{658}{4955} \end{aligned}$$

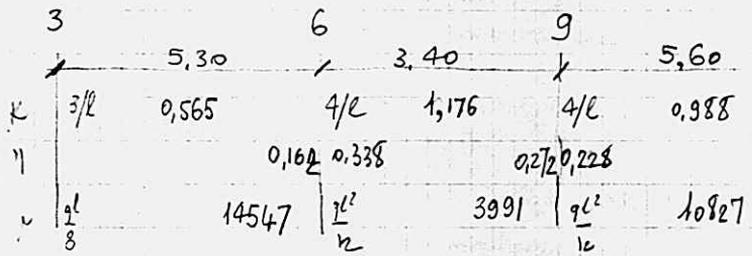


T	10822		1542	10258		6589	11515		8552
M	7732	11848	12236		-1618	6000	7380		4515
v	0,280	0,227	0,223			0,318	0,287		0,367
σ_a	2000	1600	1800			2200	2200		2200
σ_b	80	84	88			82	80		68
A_f	16,21	36,47	29,12			11,43	11,11		8,55
A_f	9,73	21,88	29,12			-	11,28		-

TRAVE - 3-6-9-13-18-21-24



Analisi carichi solari $0,5 \times 2,95 \times 705 = 1040$
 carico conc. $0,5 \times 2900 = 950$
 sbal. $1,6 \times 800 = 1280$
 veda + singh. = 220
 p. jr. = 653
 $q = 4143 \frac{kg}{m^2}$

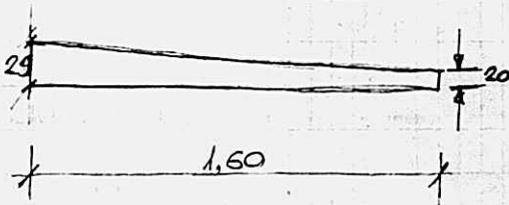


	+14547	+10556	-3991	+3991	-6836	-10827	+10827
	-1710	-3568	+2836	+2836	+2372		
	-2169	-4524	+3030	+3030	+2590		
	-2211	-4612	+3114	+3114	+2610		
	-2215	-4620	+3116	+3116	+2612		
	-2215	-4624	+3116	+3116	+2612		
	10117	10117	5602	5603		13439	

T	3070	12388	13711	5715	10201	13000	
M	6465	9928	10117	-1660	5603	6955	13439
v	0,307	0,247	0,245		0,330	0,296	0,213
α_a	2200	1800	1800		2200	1800	1600
α_b	84	84	80		78	81	86
A _f	12,39	23,67	23,43		10,79	16,64	36,24
A _s	-	48,93	23,43		-	-	36,24

PENJILIHAN COPERTURA

Analisis cangkang $i = 50 \text{ cm.}$
 $b = 12 \text{ cm.}$



$$\begin{aligned} \text{p. pr. } & 0,12 \times (0,29 + 0,20) \times 1,60 \times 2500 = 73,54 \\ \text{forat } & 140^2 \times 1,60 = 224 \\ \text{pavim. } & 70 \times 1,6 = 112 \\ \text{Jahr. acc. } & 0,5 \times 400 \times 1,6 = 320 \\ & \hline & 799 \end{aligned}$$

conc. $\text{relekt. } (190 + 30) \times 0,5 = 110 \text{ Kg.}$

$$M_{\text{max}} = \frac{799 \times 1,60}{2} + 110 \times 1,60 = 639,2 + 176 = 815,2 \text{ Kg m}$$

$$v = \frac{26}{\sqrt{\frac{81520}{12}}} = \frac{26}{82,42} = 0,315$$

$$\sigma_a = 2200 \text{ Kg cm}^{-2}$$

$$w = 10$$

$$\sigma_b = 82 \text{ Kg cm}^{-2}$$

$$t = 0,01530$$

$$f = 1,57 \text{ cm}$$

TESTATA L.3-5

SLT.

25x100



LOTTO Δ NEGOZI

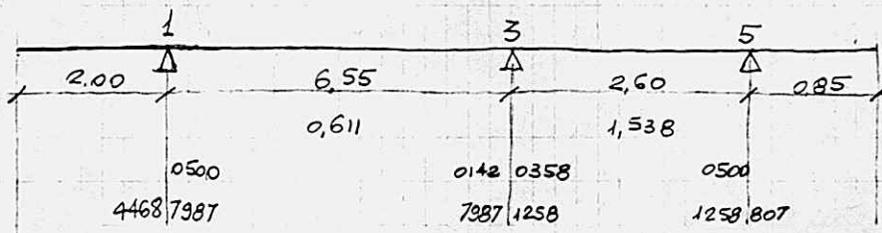
ANALISI CARICHI

Solaio $05 \times 4,95 \times 650 = 1609 \text{ Kg m}^{-1}$

p p.v.

625 -

Ext. 2234 Kg m^{-1}



4975 | 6849

5540

0604

2000

38

3,33

4959

7001 | 4581

6010

0580

2000

40

3,64

669 | 2513

1313

1414

SPINA 2.4.6

sez.

25x100



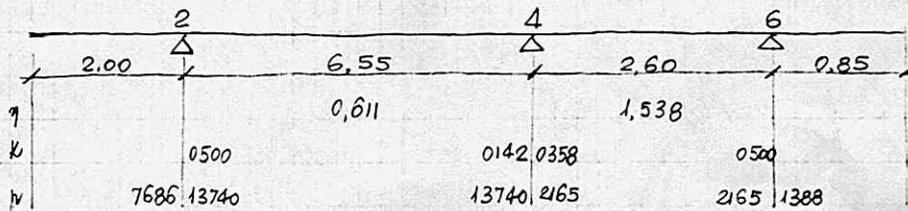
LOTTO 4, NEGOZI

ANALISI CARICHI:

$$\text{solai} 0,5(4,95+4,95)650 = 3218 \text{ kg m}^{-1}$$

$$\text{p. p.} 0,25 \times 1,00 \times 2500 = \frac{625}{-}$$

$$\text{tot } 3843 \text{ kg m}^{-1}$$



$$7686 | 11816$$

$$7686$$

$$0513$$

$$2000$$

$$44$$

$$4,50$$

$$10479$$

$$0440$$

$$2000$$

$$52$$

$$6,14$$

$$13356 | 9359$$

$$12730$$

$$0399$$

$$2000$$

$$60$$

$$7,72$$

$$6,60 |$$

$$633 | 3267$$

$$-1333$$

$$1232$$

$$2000$$

$$-20$$

$$0,883$$