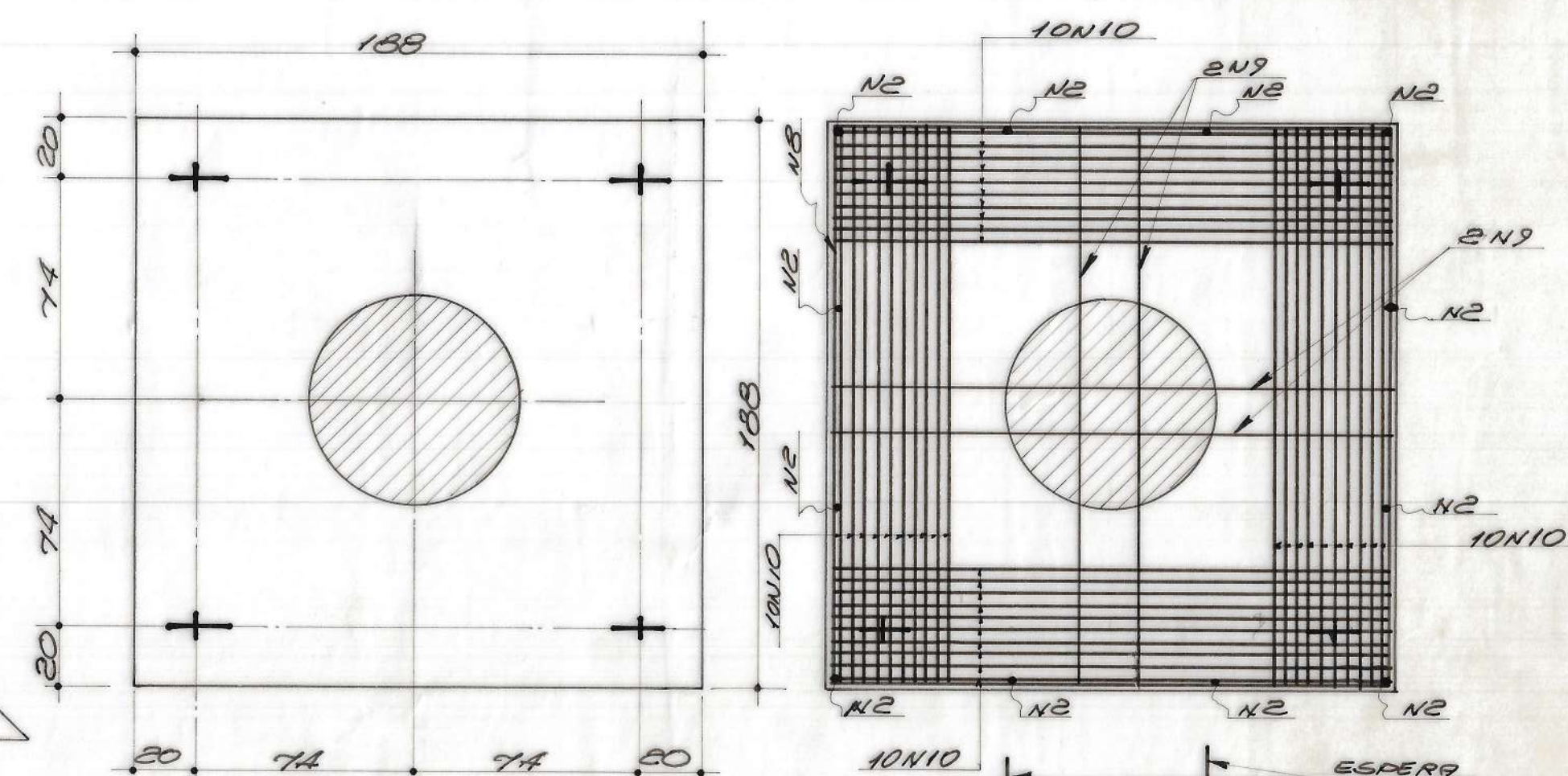
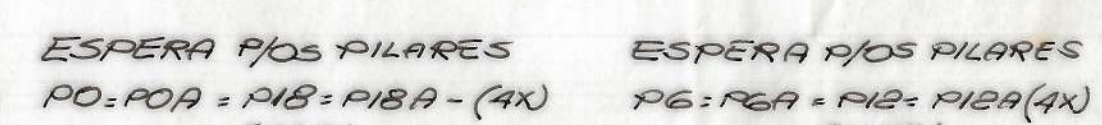
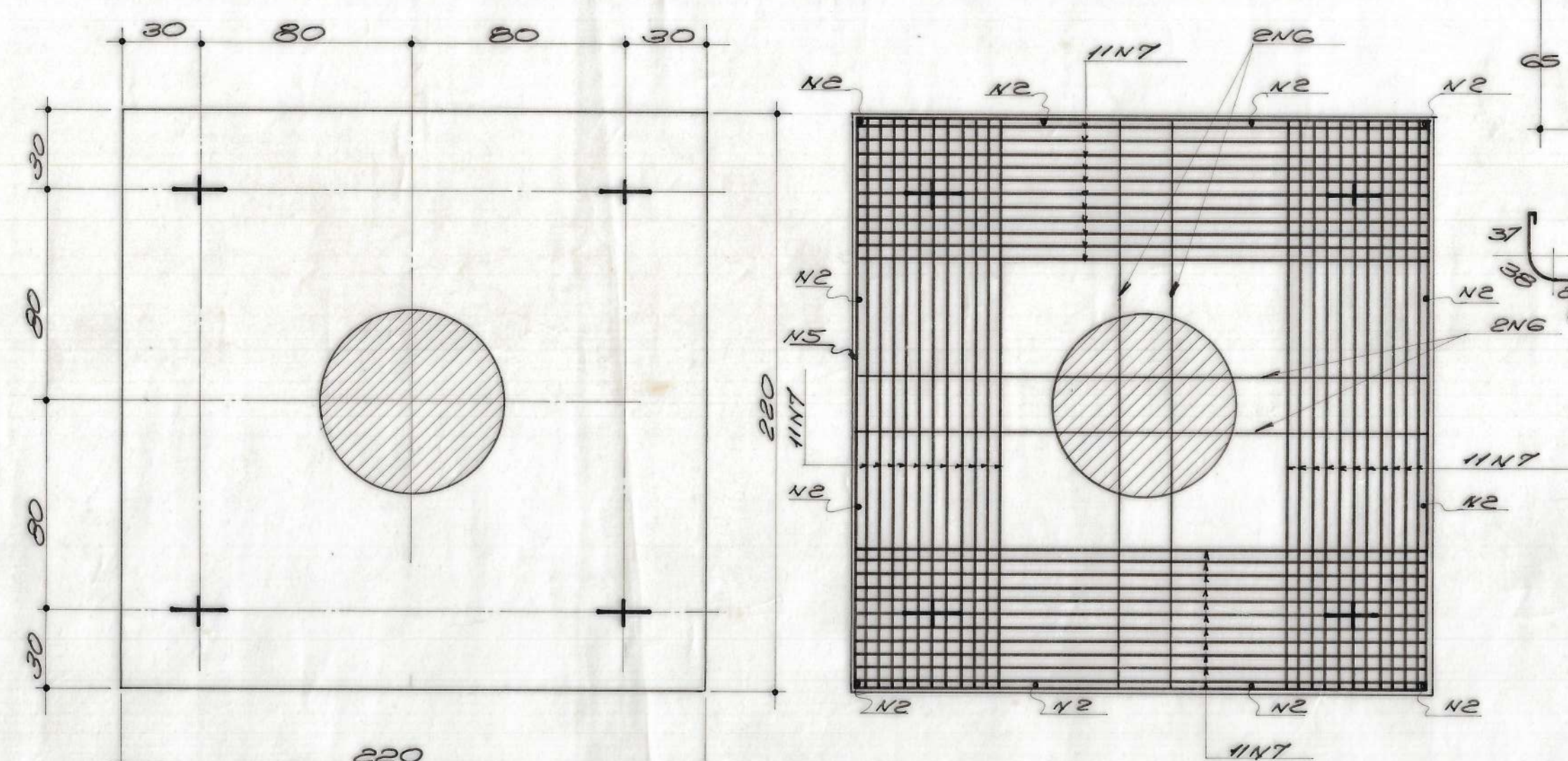


FÔRMA E ARMADURA DO BLOCO DE 4 ESTACAS
A/O PILAR PGA - (IX) - 1:20



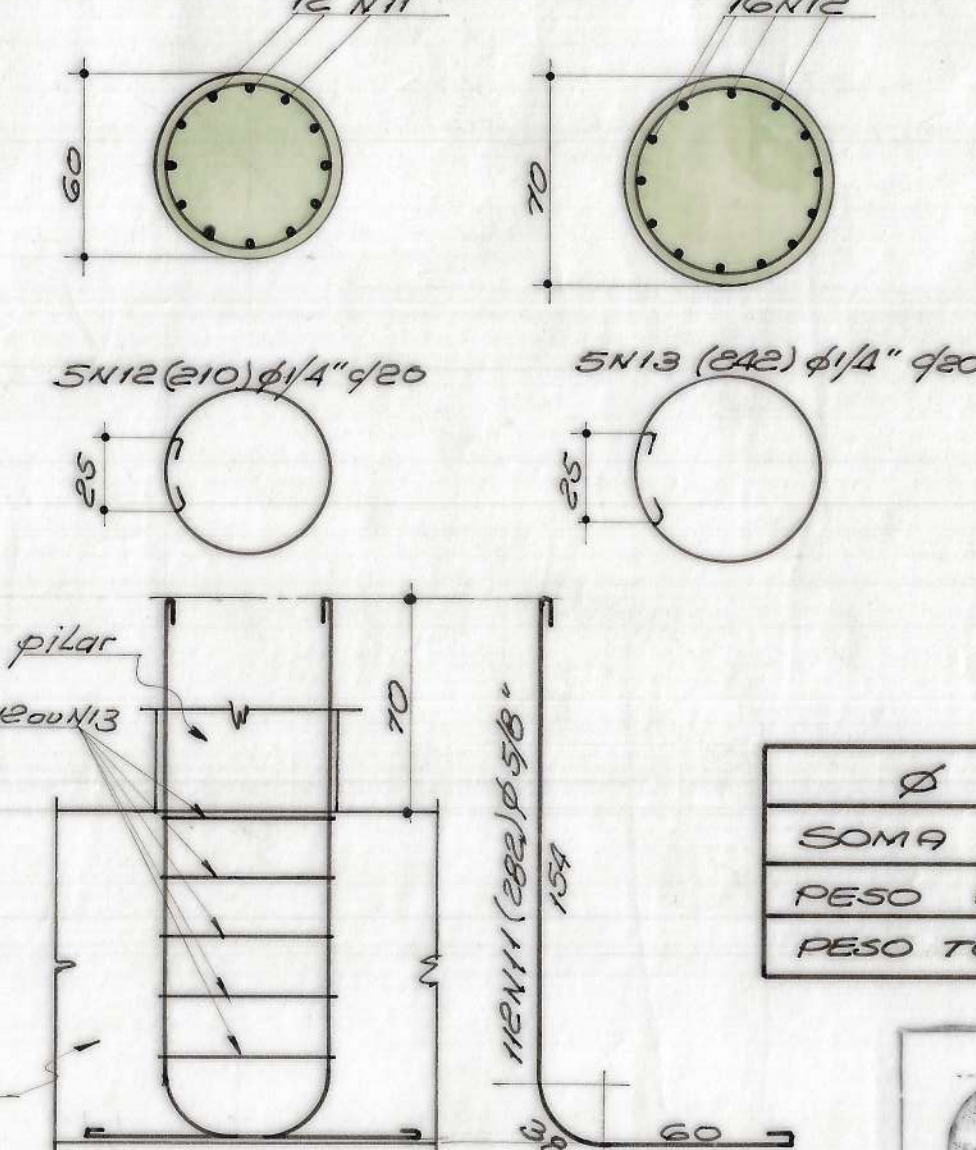
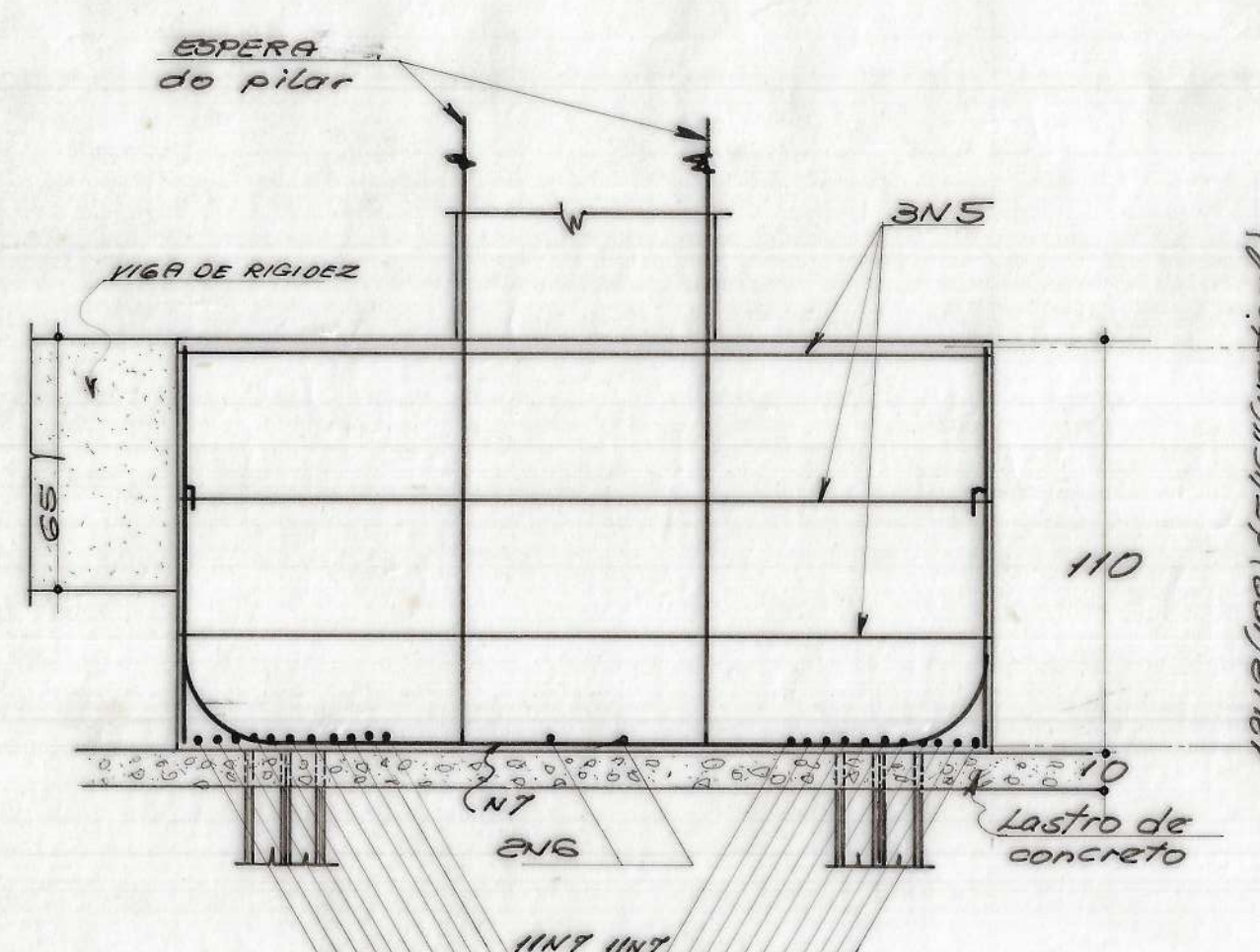
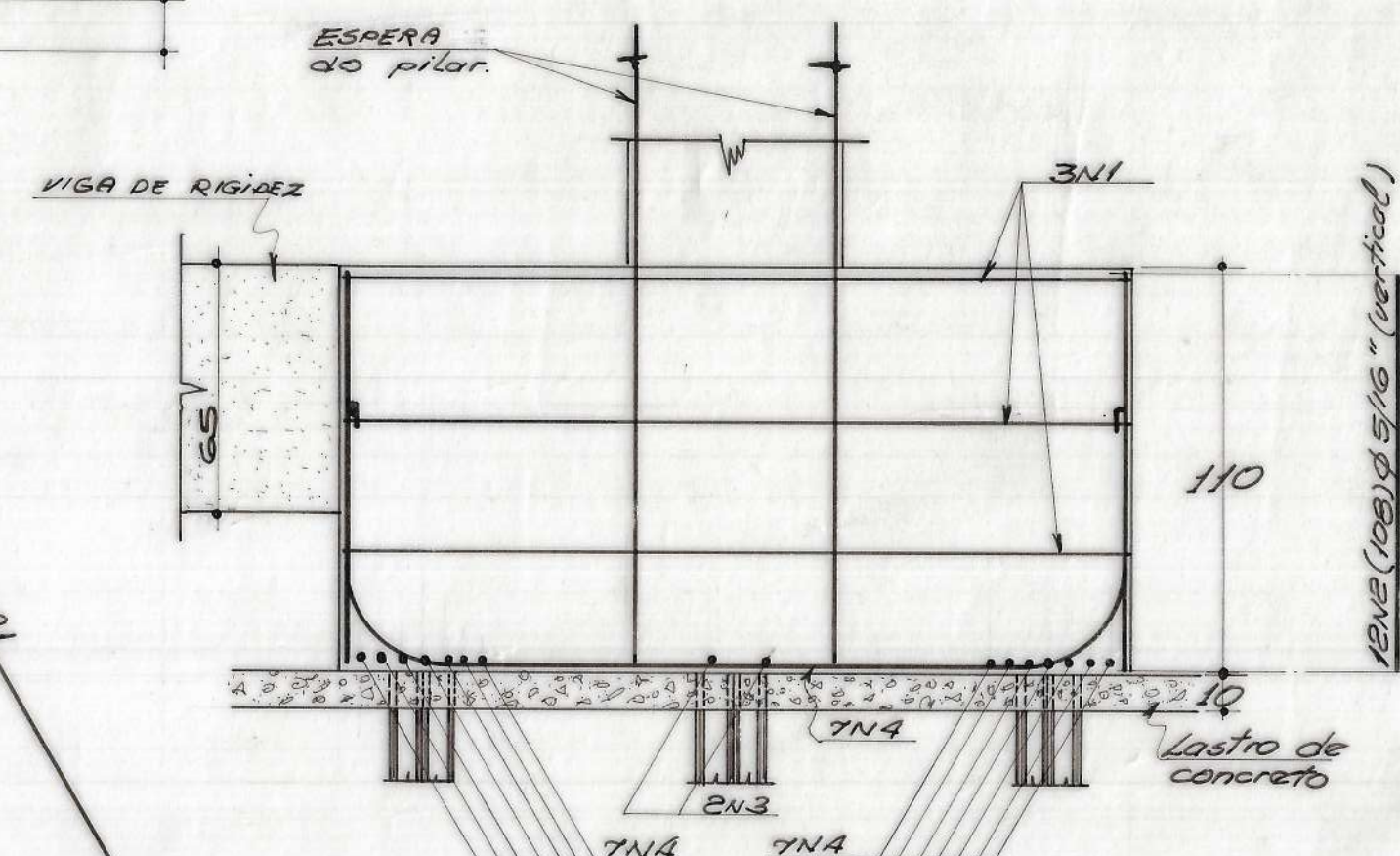
ARMAD. DA VIGA DE
RIGIDEZ (4X) - 1:25

FÔRMA E ARMADURA DOS BLOCOS DE 4 ESTACAS
P/OS PILARES - PG = P12 = P129 - (3x) - 1:20



Nº	D	Q	COMPAR UNITAT
1	5/16	12	65
2	"	96	100
3	3/4	24	30
4	3/4	84	145
5	5/16	9	87
6	1/2	12	350
7	3/4	130	360
8	5/16	3	75
9	1/2	4	32
10	3/4	40	33
11	5/8	112	28
12	1/4	20	210
13	"	20	24
14	5/8	40	105
15	5/16	24	92
16	"	248	12

Ø	1/4"	5/16"	1/2"	5/8"	3/4"
SOMIA M.	90,40	923,72	123,68	737,04	924,66
PESO Kg	23,00	359,00	128,00	1.144,00	2.067,00
PESO TOTAL = 3.721,00 (sem juros)					



NOTAS:

- 1) - concreto adotado $R = 150 \text{ kg/cm}^2$
- 2) - Aço empregado CA-50 (pelegada)
- 3) - Todas as dimensões devem ser conferidas na obra.
- 4) - Razões de curvatura para $\phi 5/8"$ vide folha n:4 e para $\phi 3/4"$

OBSERVAR: $R = 27 - r = 3,7 - a = 4,2$

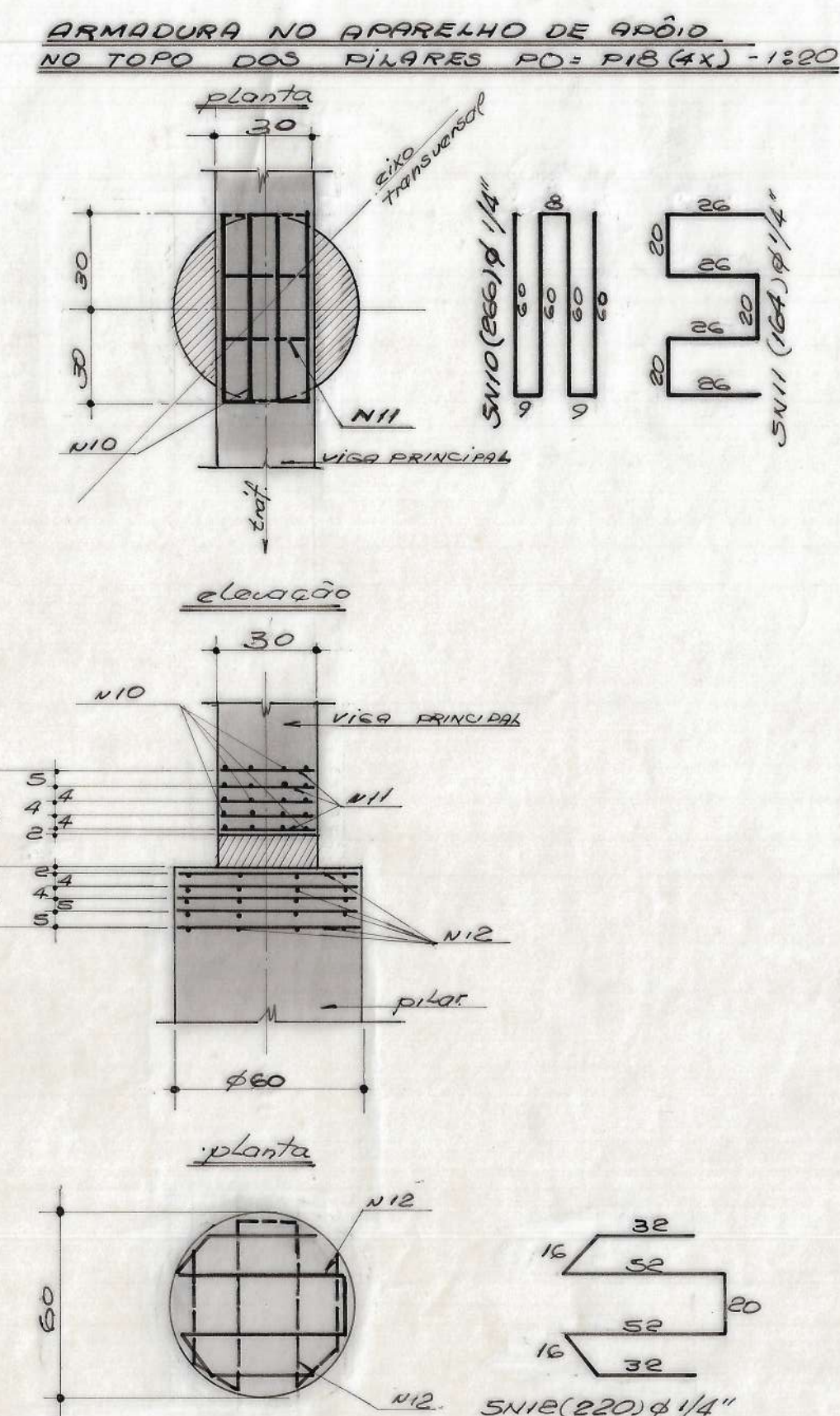
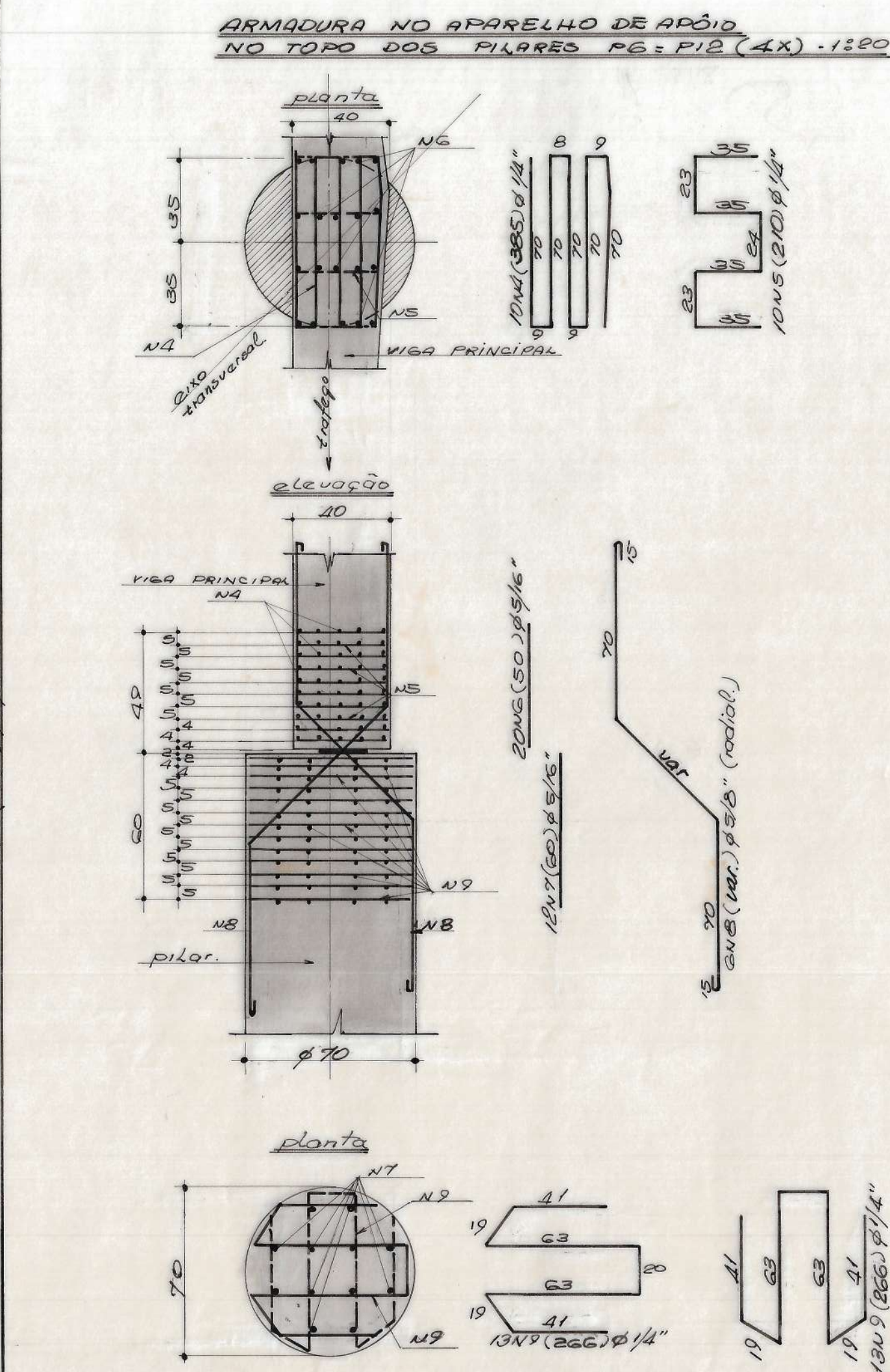
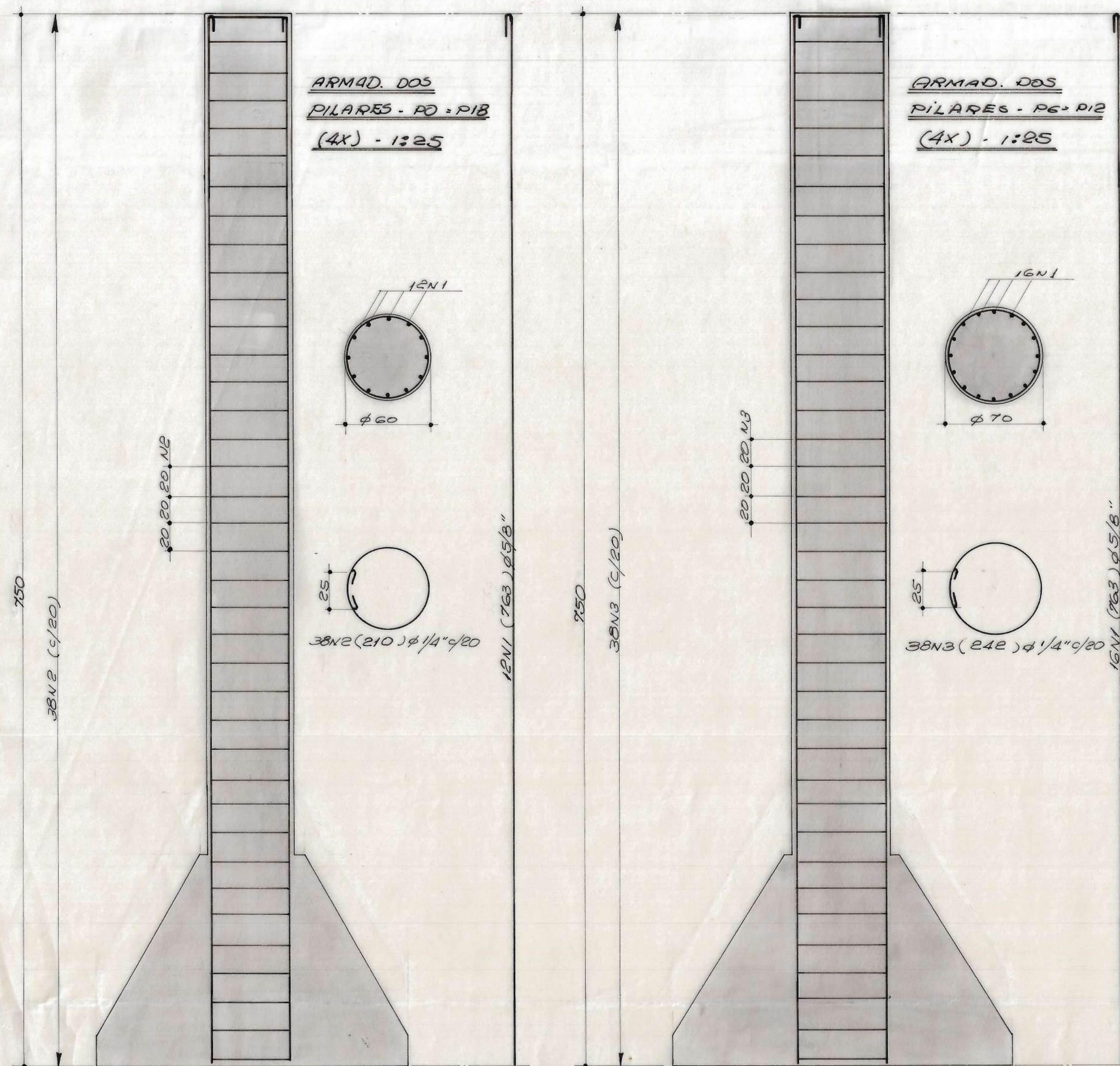
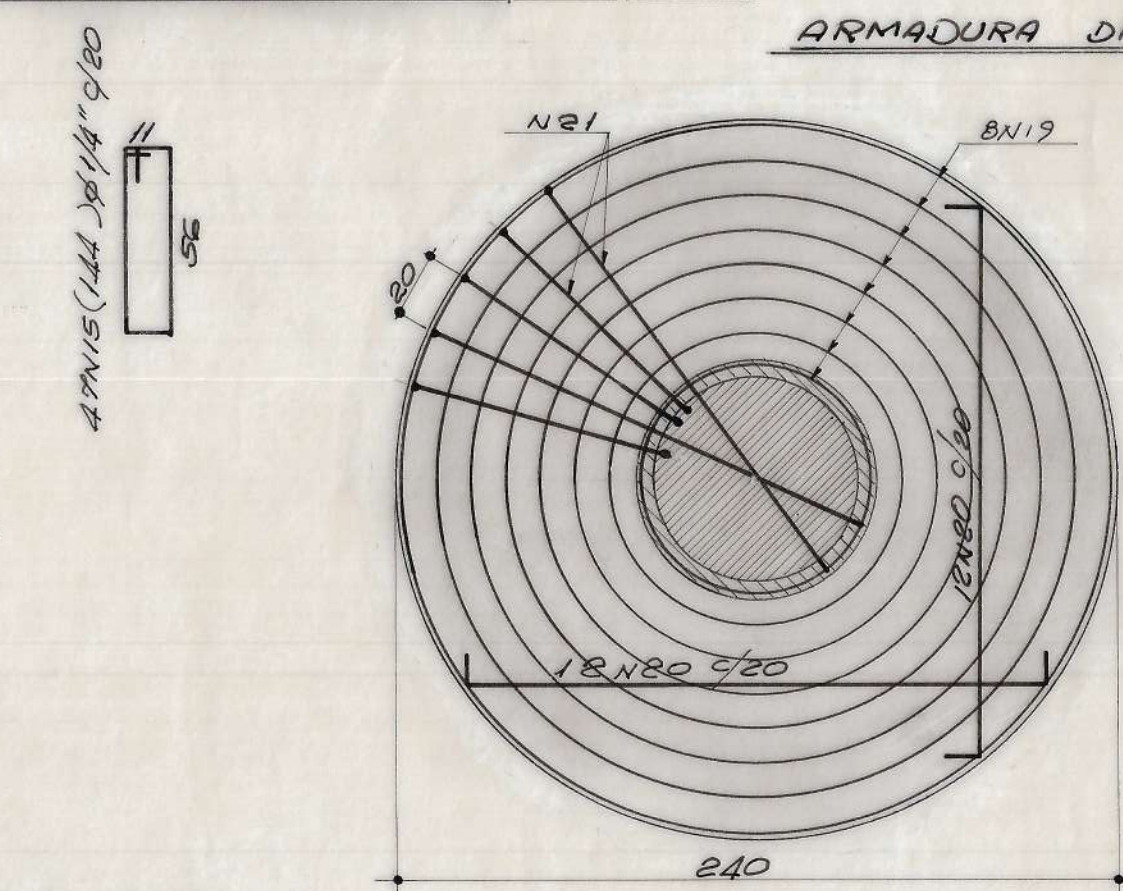
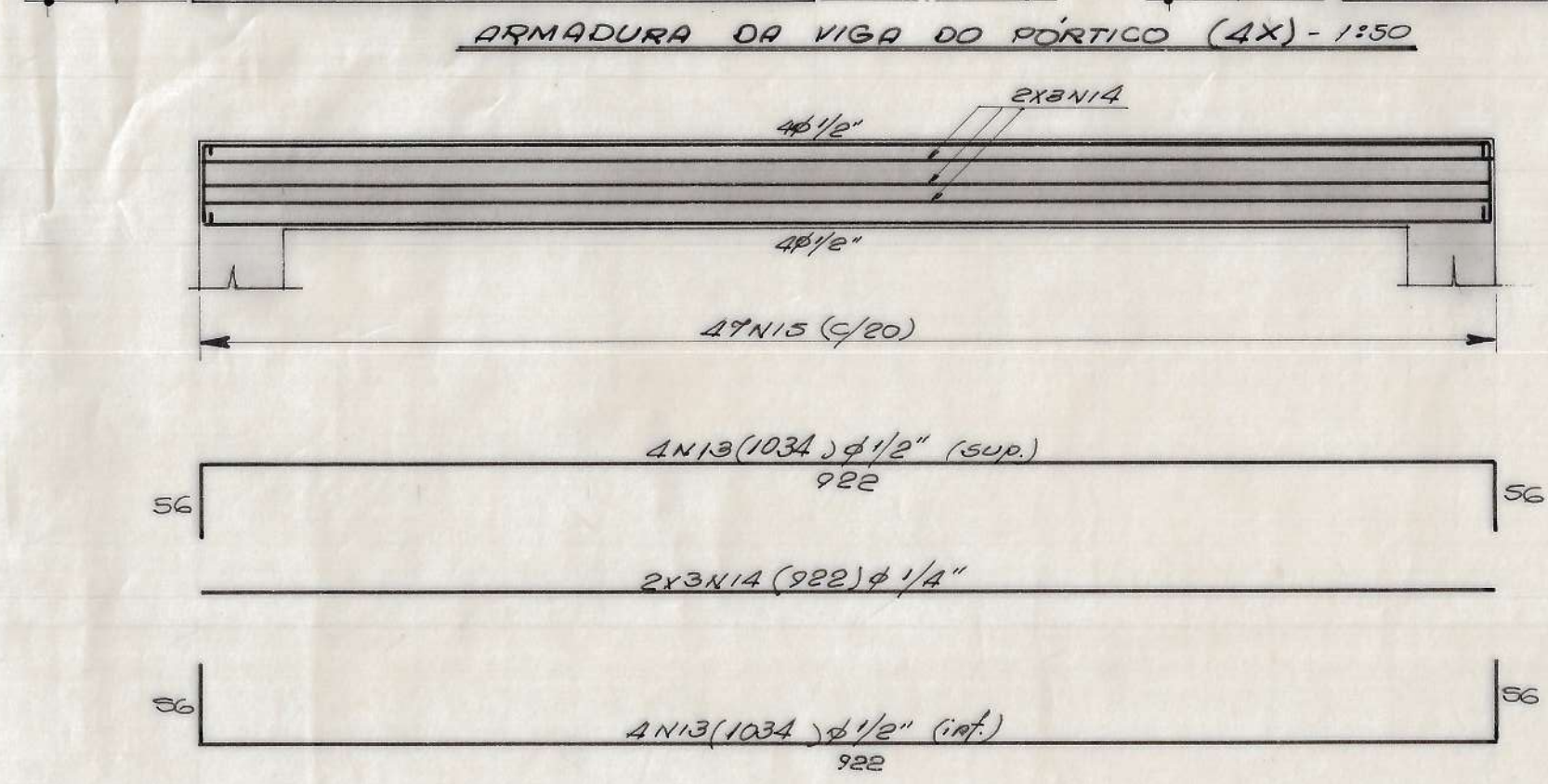
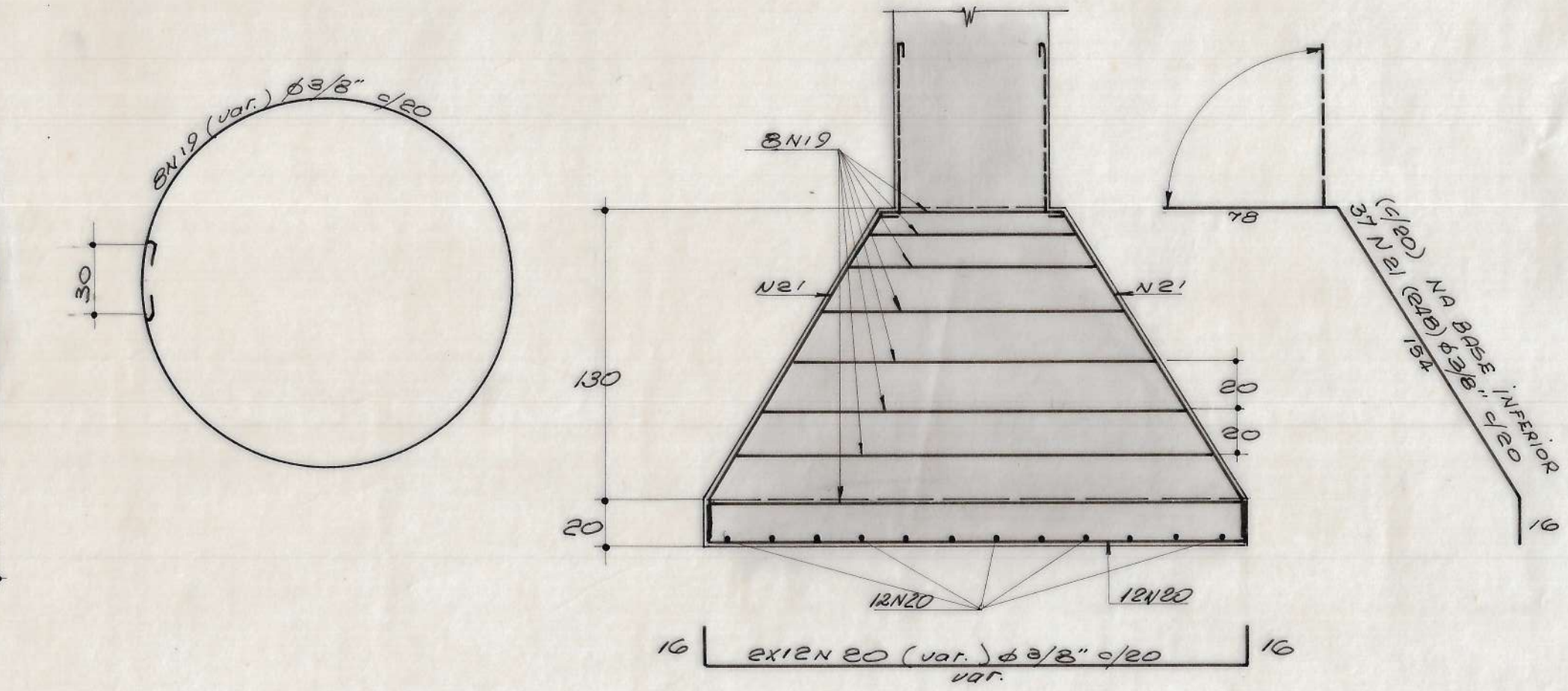


tabela das armaduras

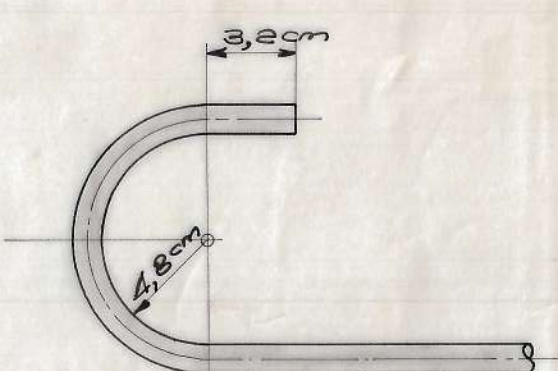
Nº	D	Q	compr. unitário
1	5/8	112	763
2	1/4	152	210
3	"	152	212
4	"	40	385
5	"	40	210
6	5/8	80	50
7	"	48	60
8	5/8	24	var.
9	1/4	104	266
10	"	20	266
11	"	20	164
12	"	40	220
13	1/2	32	1034
14	1/4	24	222
15	"	128	144
16	3/8	32	var.
17	"	88	"
18	"	136	234
19	"	32	var.
20	"	96	"
21	"	148	248



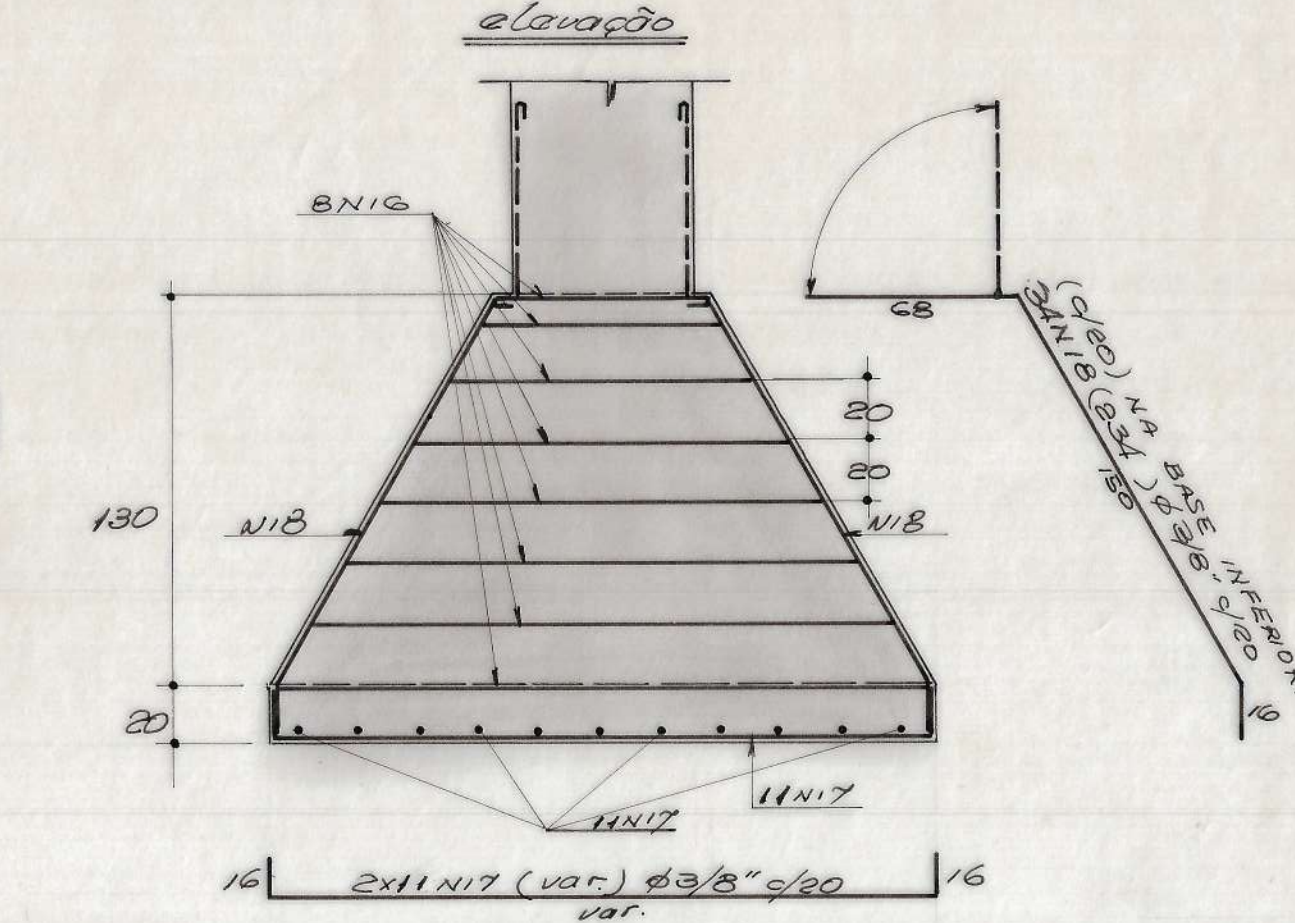
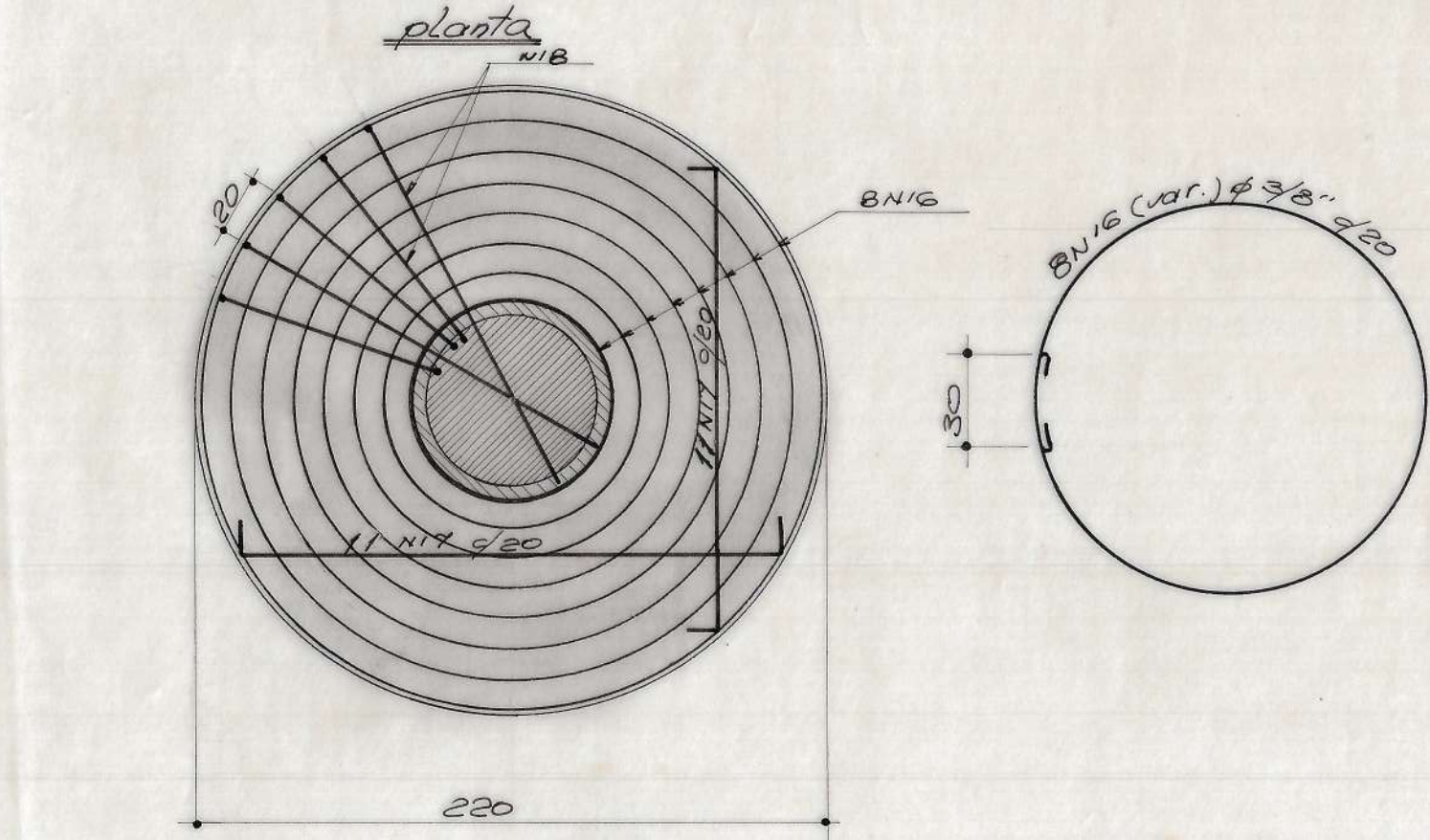
ARMADURA DAS SAPATAS P/OS PILARES PG = P12 - (4X) - 1:25



DET. DA CURVATURA DOS GANCHOS P/OS Ø DE 5/8"



ARMADURA DAS SAPATAS P/OS PILARES PD = P18 - (4X) - 1:25



Resumo do Aço

Ø	1/4"	5/8"	3/8"	1/2"	5/8"
Soma m.	1.666,08	68,80	1.442,88	320,88	214,32
Peso kg	414,00	27,00	801,00	329,00	142,00
PESO TOTAL =	2.991,00 Kg (sem perdas)				

- NOTAS:
- 1) - Concreto adotado $f_{Rk} = 150 \text{ kg/cm}^2$
 - 2) - Aço empregado CA-50 (Fol.)
 - 3) - Todas as dimensões devem ser conferidas na obra.
 - 4) - Recobrimento 2cm.

P.A. WENDLER S.C. ESTRUTURAS
 Engenheiros Responsáveis:
 PAULO AUGUSTO WENDLER - Cart. Prof. 3860 - CREA 7.º Reg.
 MANFRED THEODOR SCHMID - 14360
 ODERIR MÜLLER - 10960

RUA PADRE ANTONIO, 31 - FONE 247473 - 53520 - CAIXA POSTAL 6031 - CURITIBA - PR

OBRA: PONTE SOBRE O RIO RATONES - RODOVIA SC. 21

ARMADURA DA INFRAESTRUTURA

Calculo: [assinatura] Desenho: [assinatura] Verificação: [assinatura] Execução: [assinatura] Data: 11/25-11/20-11/50 10/07/72



P. A. WENDLER S. C. ESTRUTURAS

Engenheiros Responsáveis:

PAULO AUGUSTO WENDLER • Cart. Prof. 386 D - CREA 7.^a Reg.

MANFRED THEODOR SCHMID • • • 1436 D •

O D E N I R M Ü L L E R • • • 1906 D •

RUA PADRE ANTÔNIO, 311 • FONES 24.7473 • 25.5020 • CAIXA POSTAL, 5061 • CURITIBA • PR

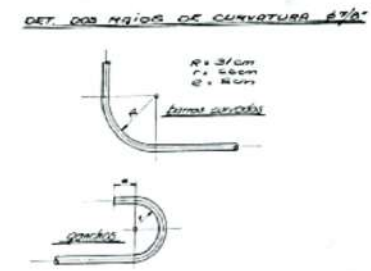
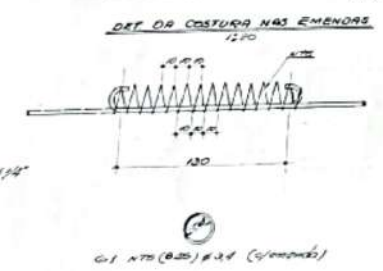
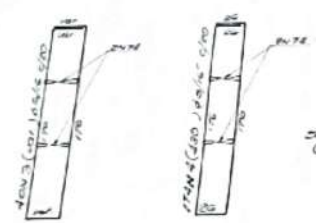
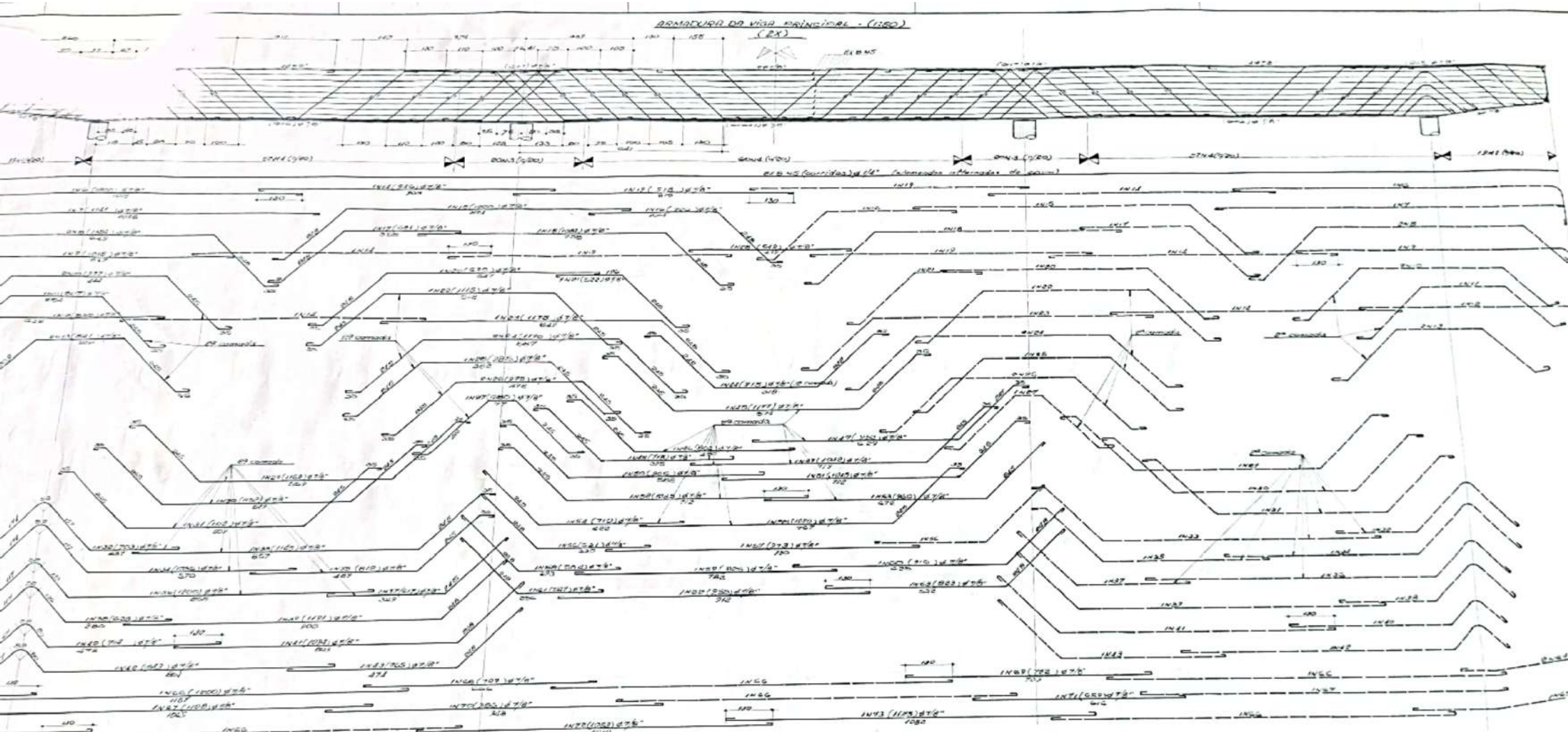
OBRA: *PONTE SOBRE O RIO RATONES - RODOVIA
SC-21*

Número

ARMADURA DA VIGA PRINCIPAL (2X)

Fólia

3

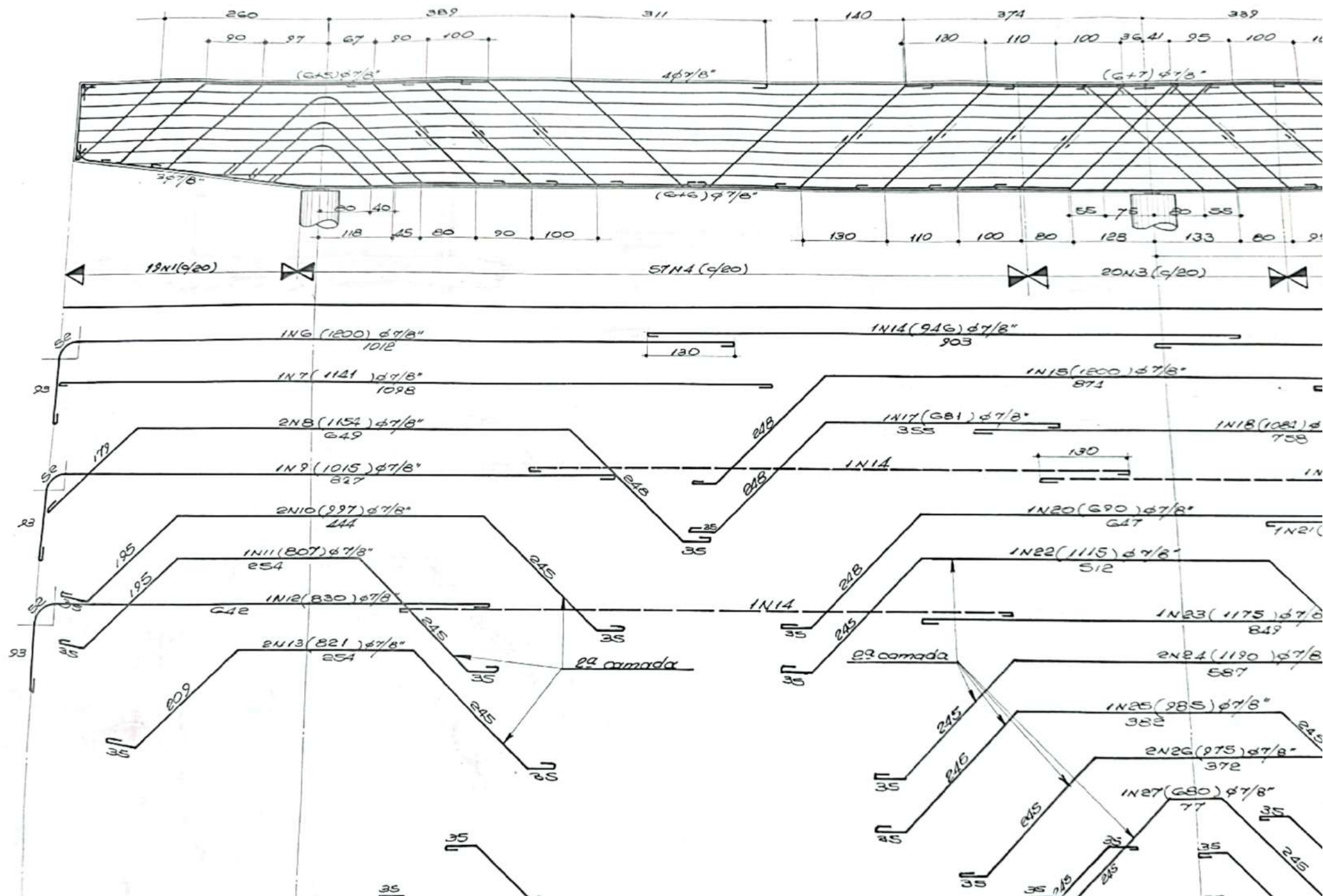


RESUMO DO 420

	1.ª	2.ª	3.ª	4.ª
Soma m	103,00	220,00	207,00	247,00
Costo R\$	74,00	273,00	204,00	247,00

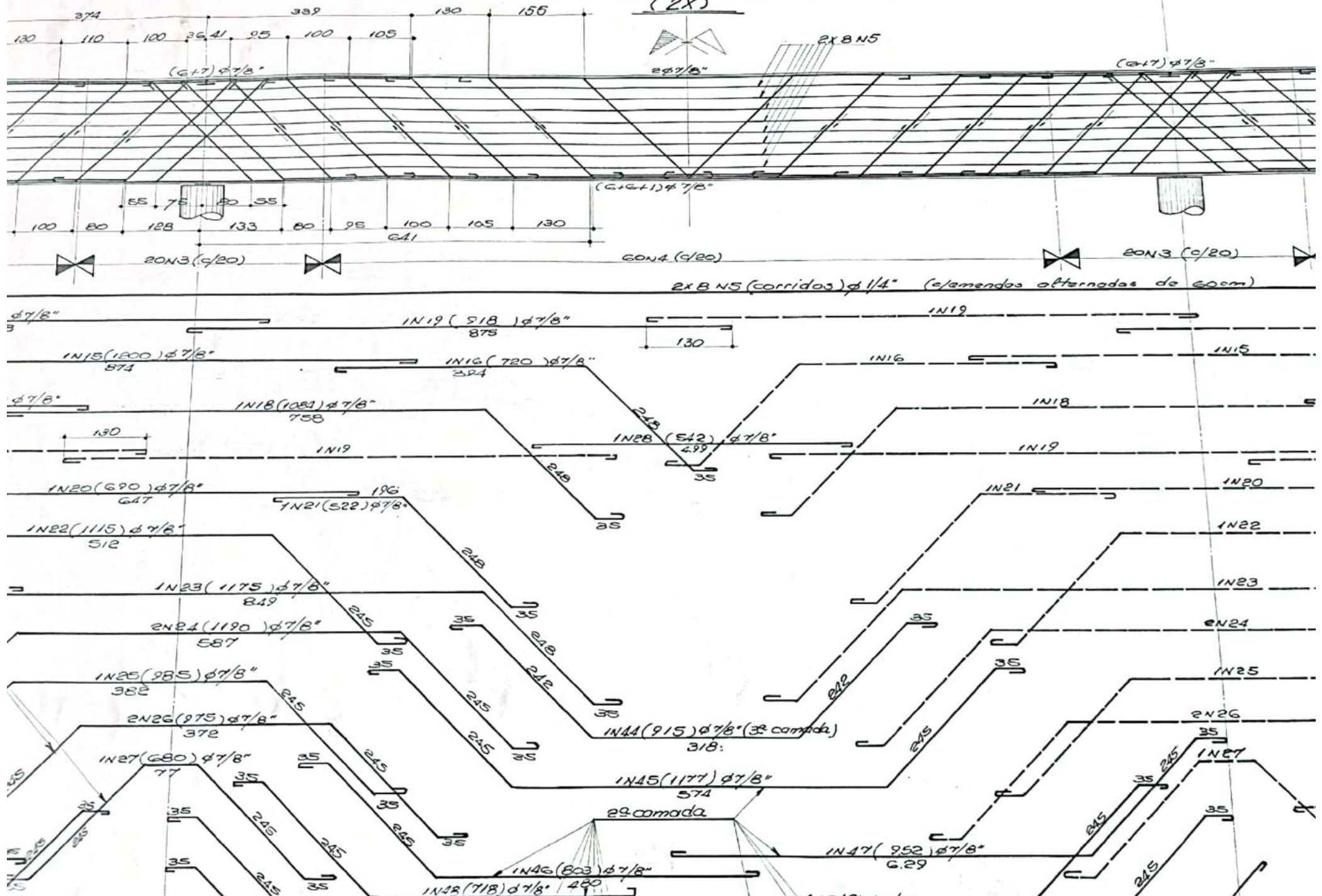
NEO TOTAL = 8 DOT. 005 (comprimento)

- NOTAS:**
- 1) Curvatura adotada (R=150) cm
 - 2) Não esquecer de 4.00 (m)
 - 3) Todas as dimensões devem ser conferidas no obra
 - 4) Acabamento com

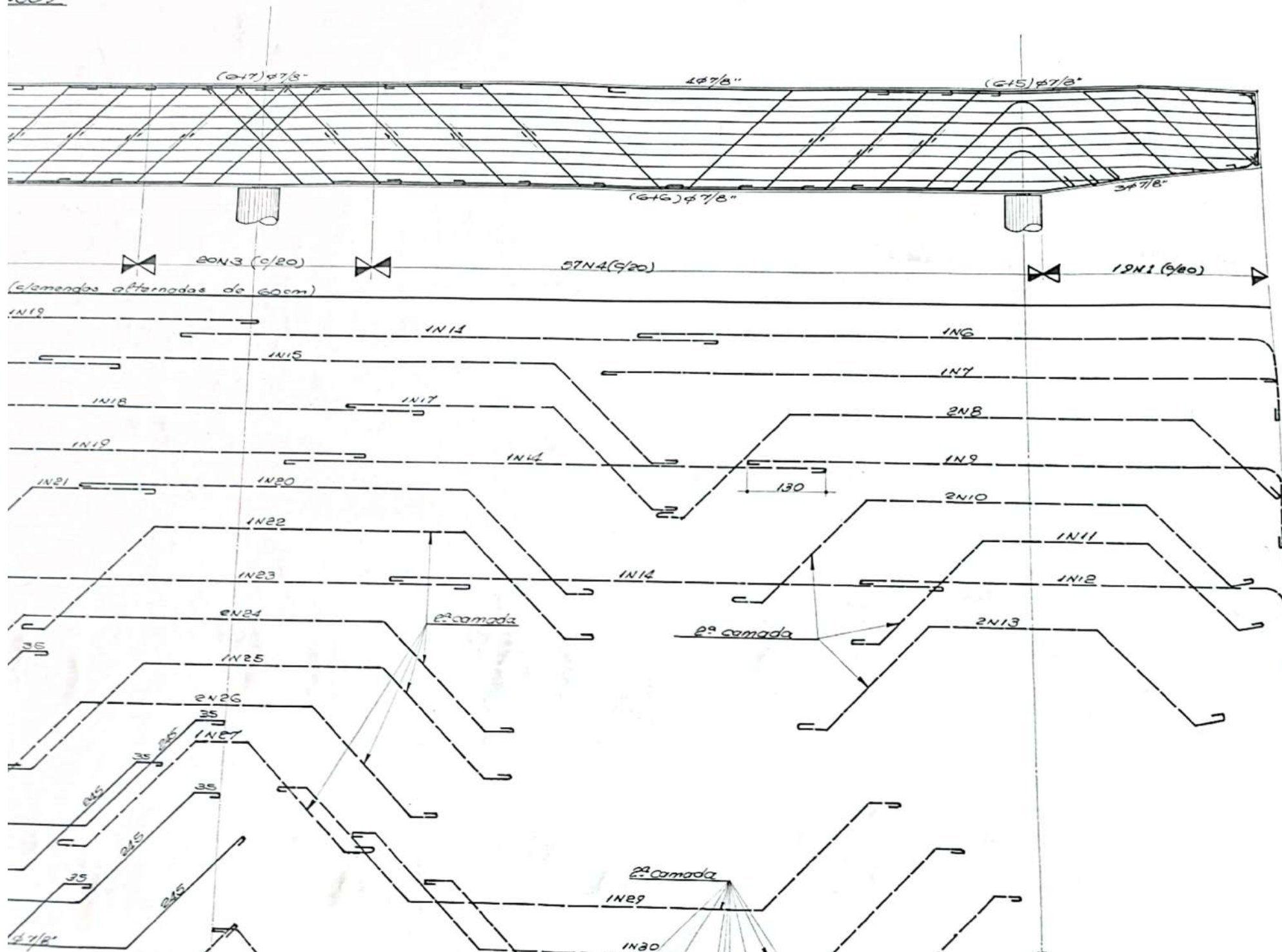


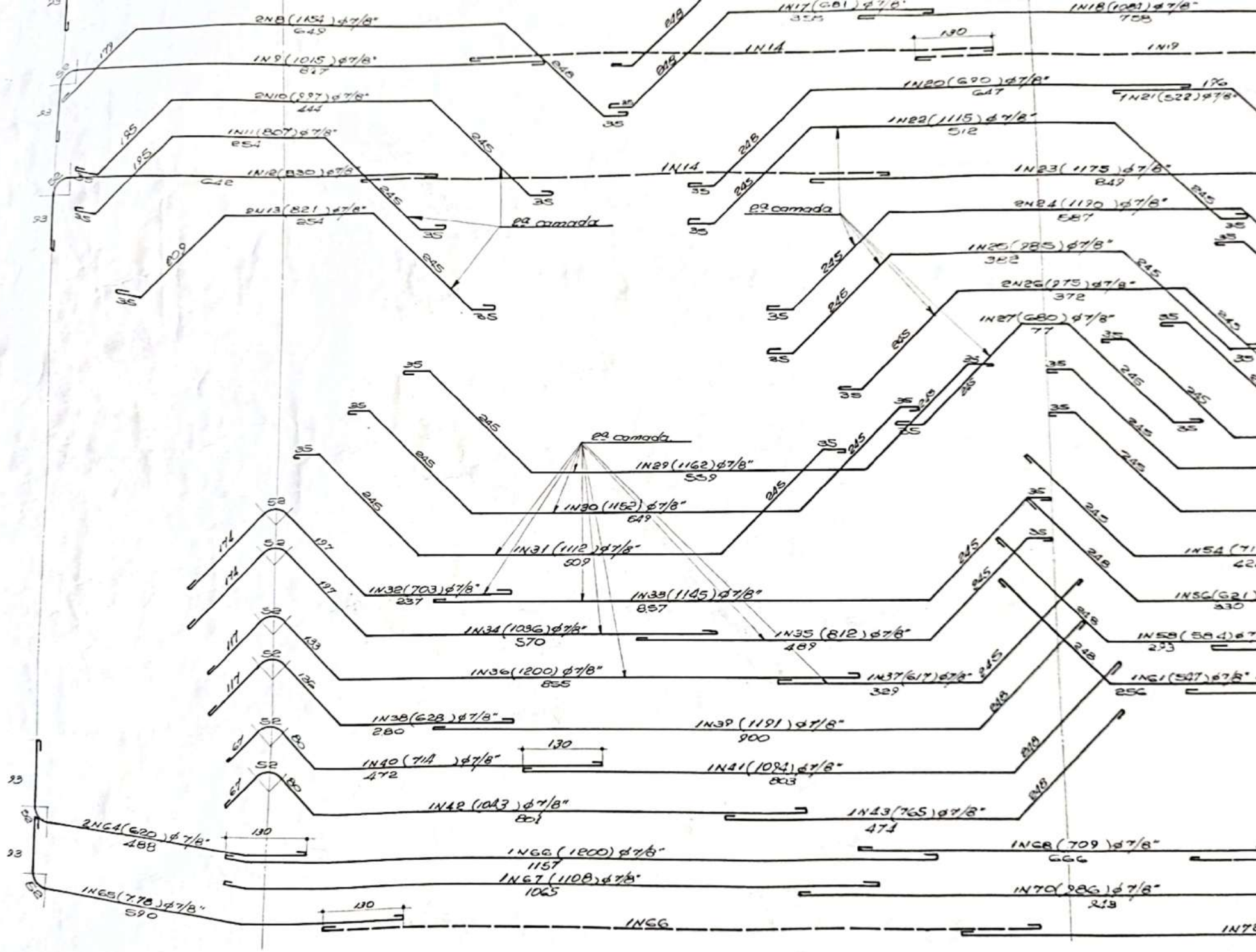
ARMADURA DA VIGA PRINCIPAL - (1:50)

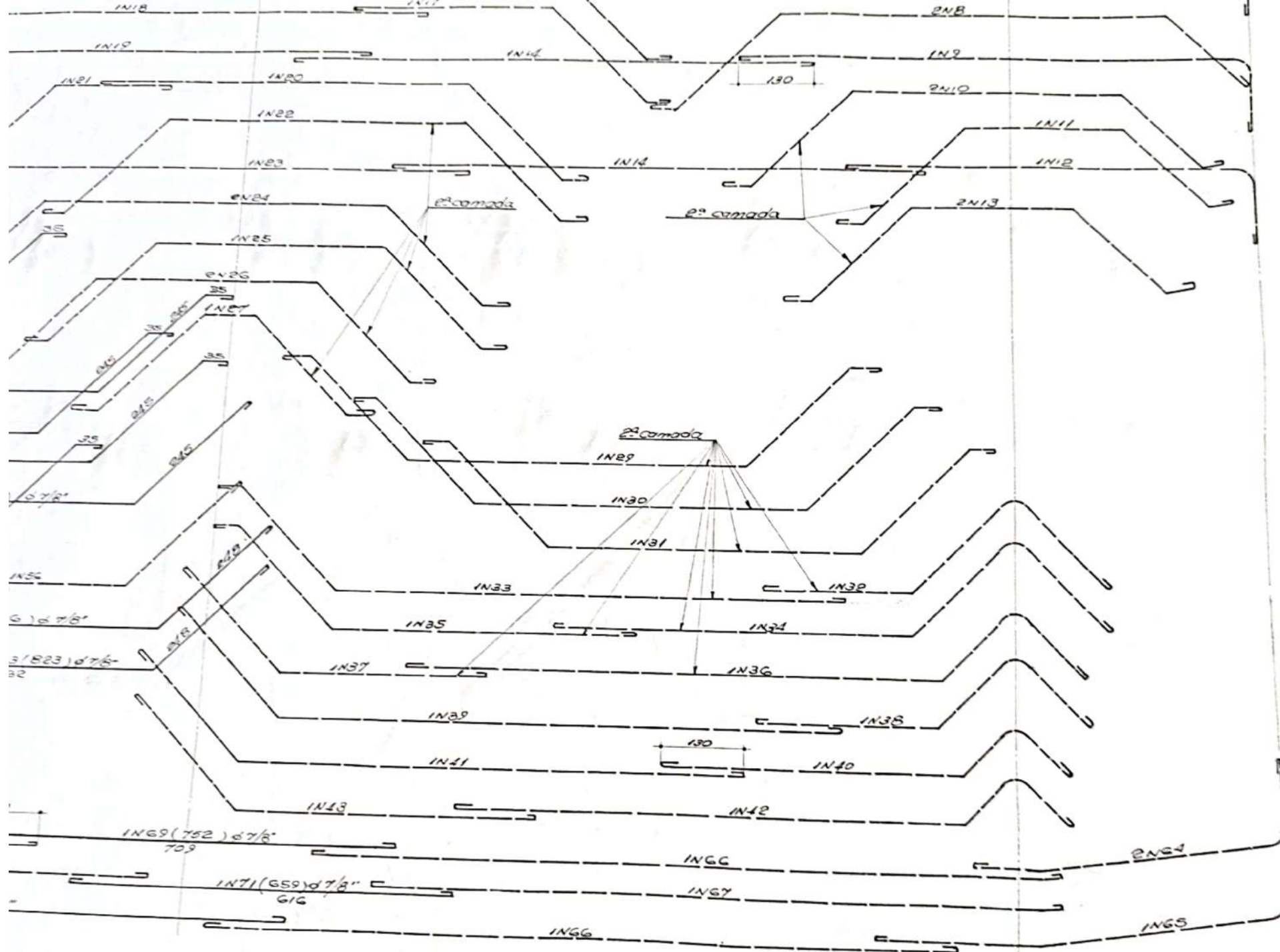
(2X)

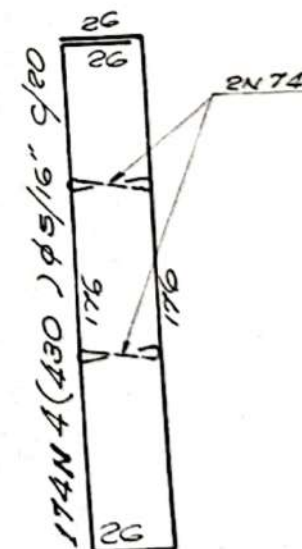
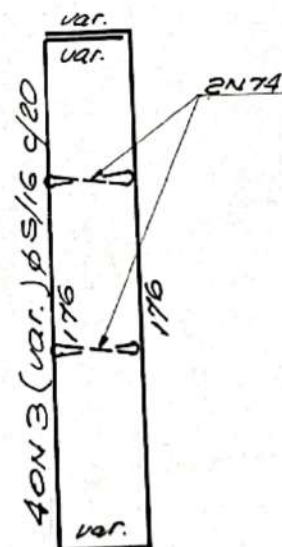
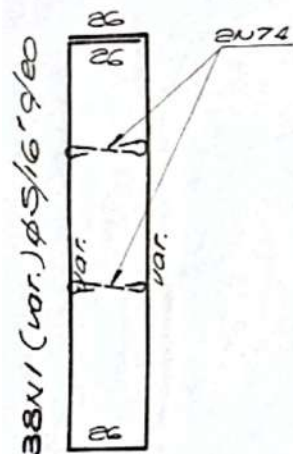
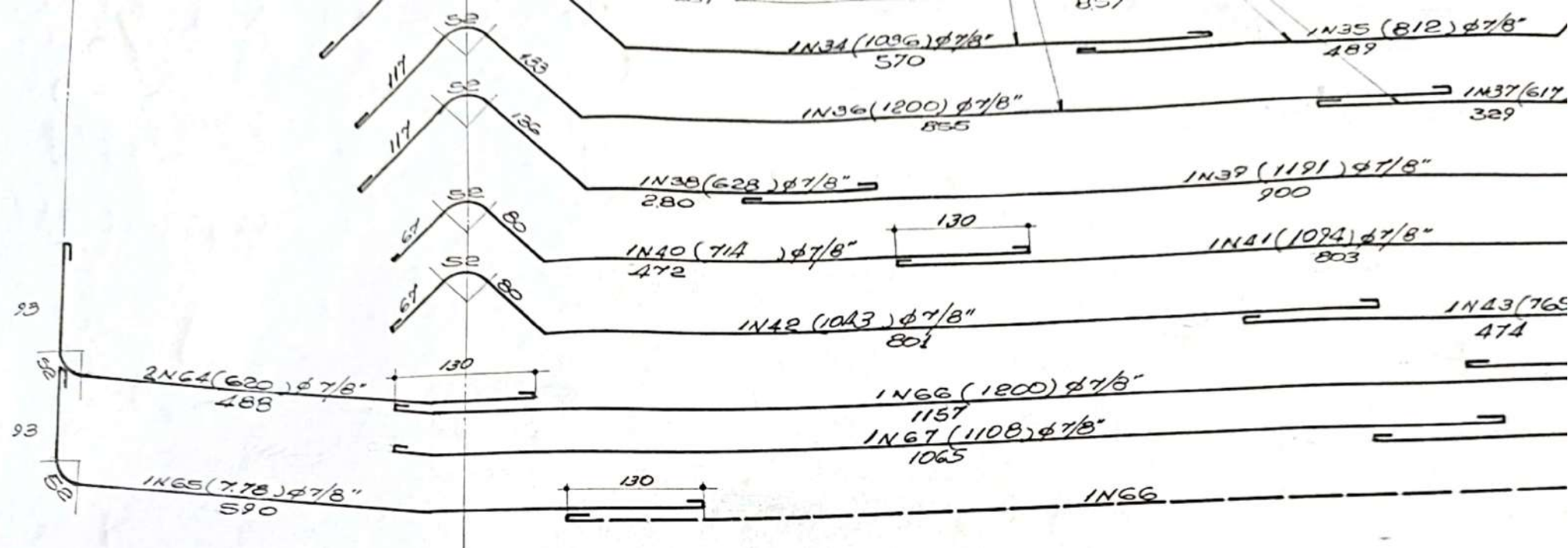


50)

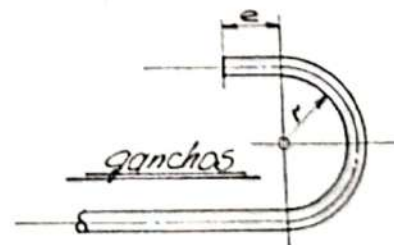
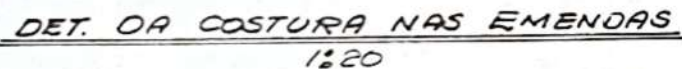




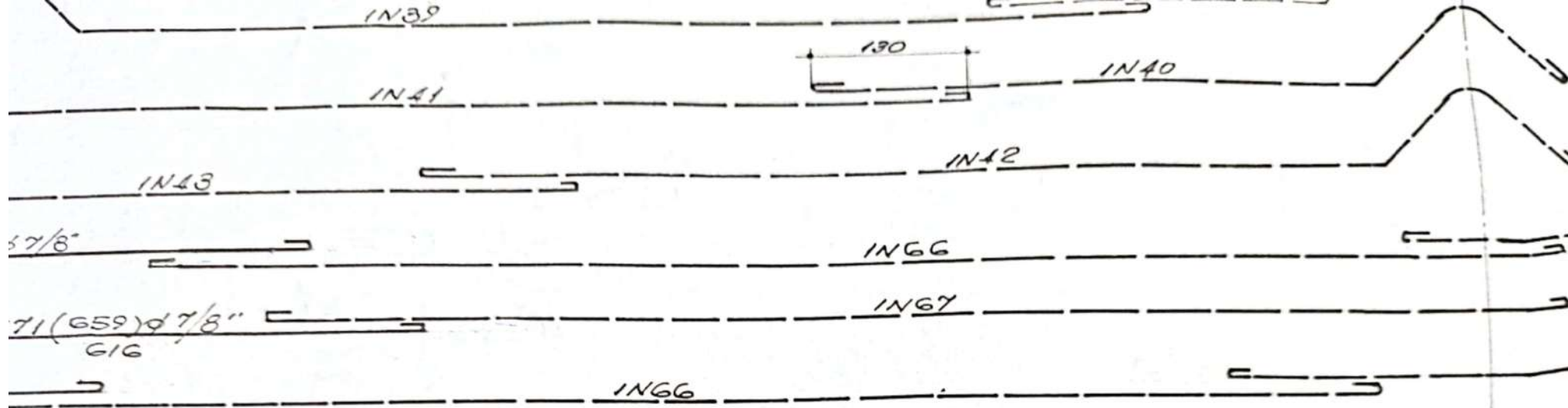




500N74 (60) φ 1/4"
(e q/estribo)



Digitalizado com CamScanner

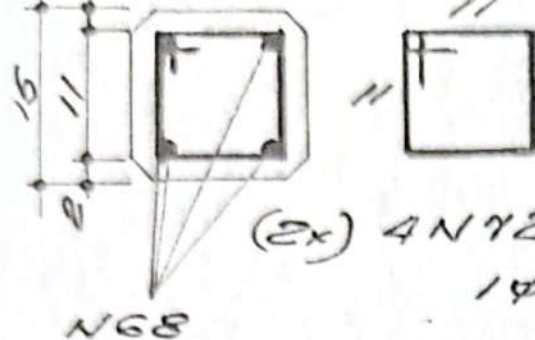


Resumo do Aço

ϕ	3,4 mm	1/4"	5/16"	7/8"
Soma m.	1.030,90	2.296,00	2.076,80	2.476,58
PÊSO Kg	74,00	570,00	806,00	7.537,00
PÊSO TOTAL = 8.987,00 Kg (sem perdas)				

NOTAS:

- 1) concreto adotado $f_c = 150 \text{ Kg/cm}^2$
- 2) Aço empregado CA-50 (pol.)
CA-60 (mil.)
- 3) - todas as dimensões devem ser conferidas na obra.
- 4) - Recobrimento 2cm



(2x) 4N72-(52)-
1φ 3.4C/20



(2x) 8N73-(32)
N69, N70 1φ 3.4C/20

1/2 (INF)



P. A. WENDLER S. C. ESTRUTURAS

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MANFRED THEODOR SCHMID - . . . 1436 D

ODENIR MÜLLER - . . . 1906 D

RUA PADRE ANTÔNIO, 311 - FONES 24.7473 - 23.6020 - CAIXA POSTAL, 6081 - CURITIBA - PR

OBRA: PONTE SOBRE O RIO RATONES

Numero

Fôlha

4

Data

31/07/92

Cálculo.

Desenho:

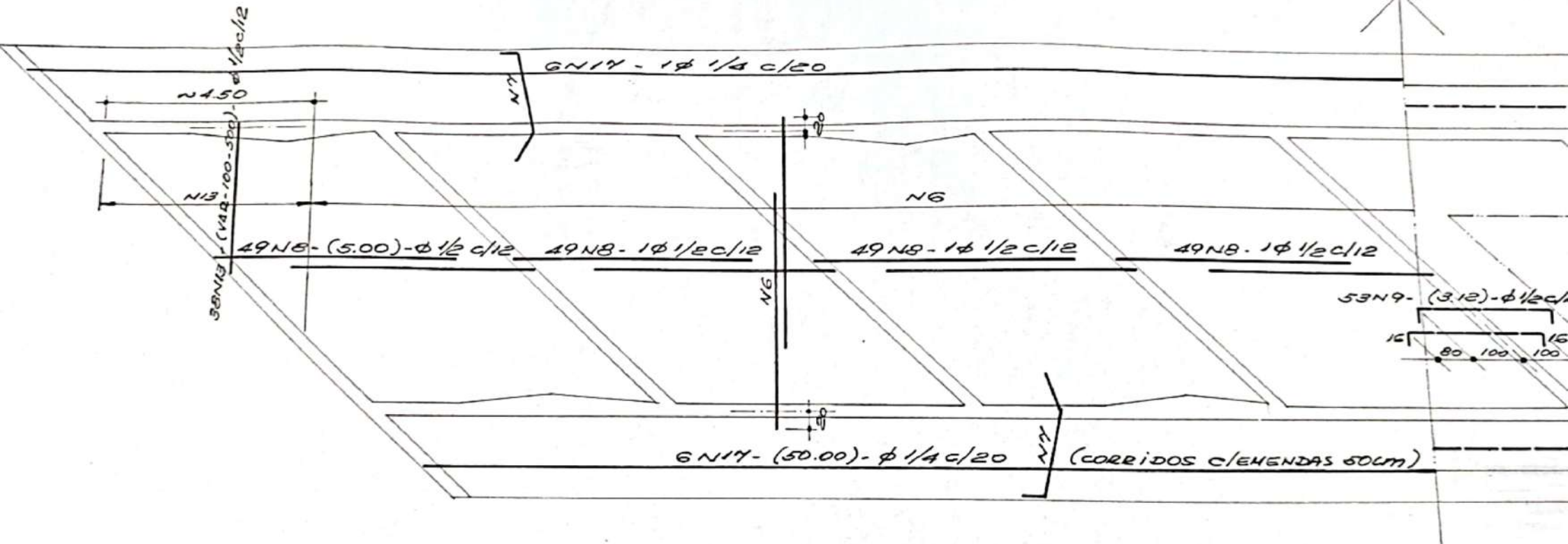
offmann

Verificação:

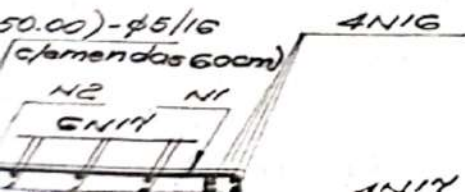
Escala:

1:10 1:20 1:25
1:50 e 1:100

ARMADURA SUPERIOR E INFERIOR



ARMADURA NA SECÇÃO TRANSVERSAL ESC 1:25



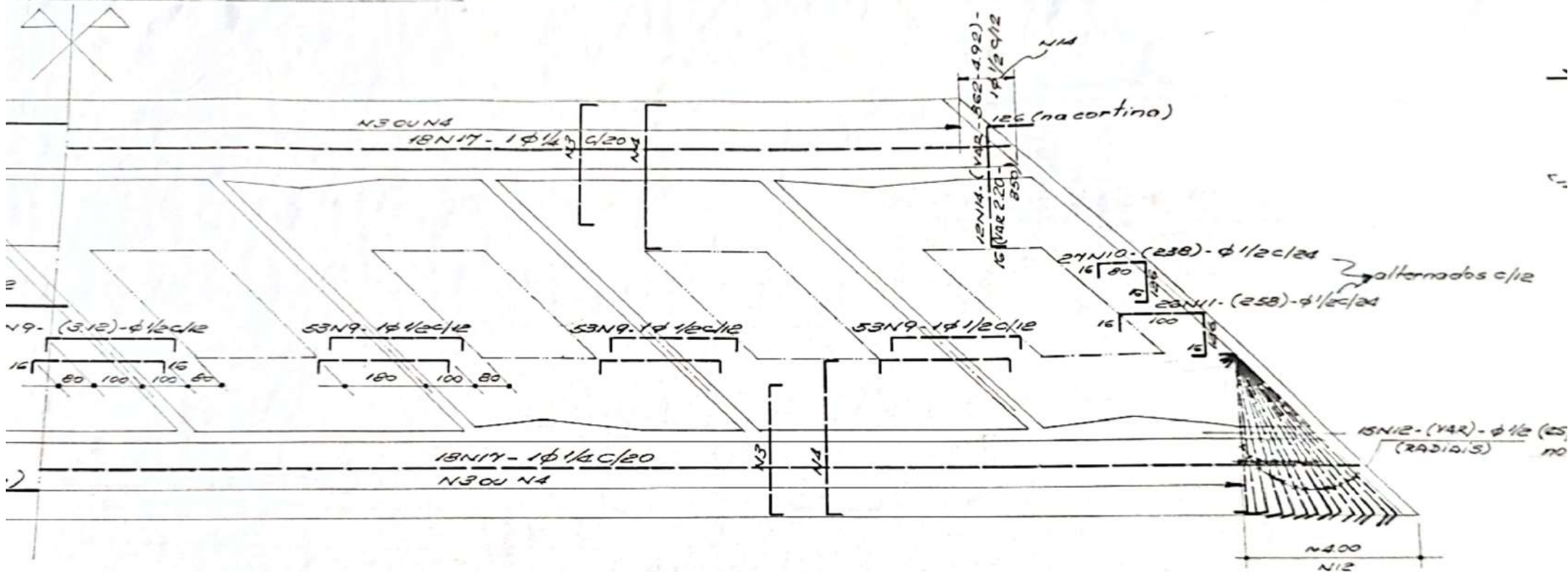
N300 N4

N6 N5

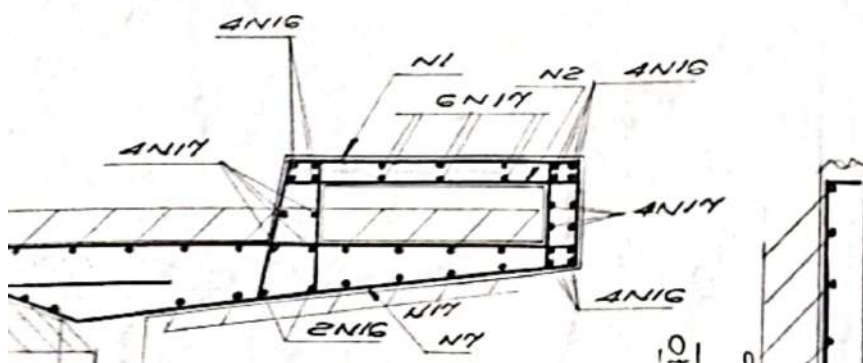
N300 N4

4 N

RIOR E INFERIOR DA LAJE



ARMADURA DAS

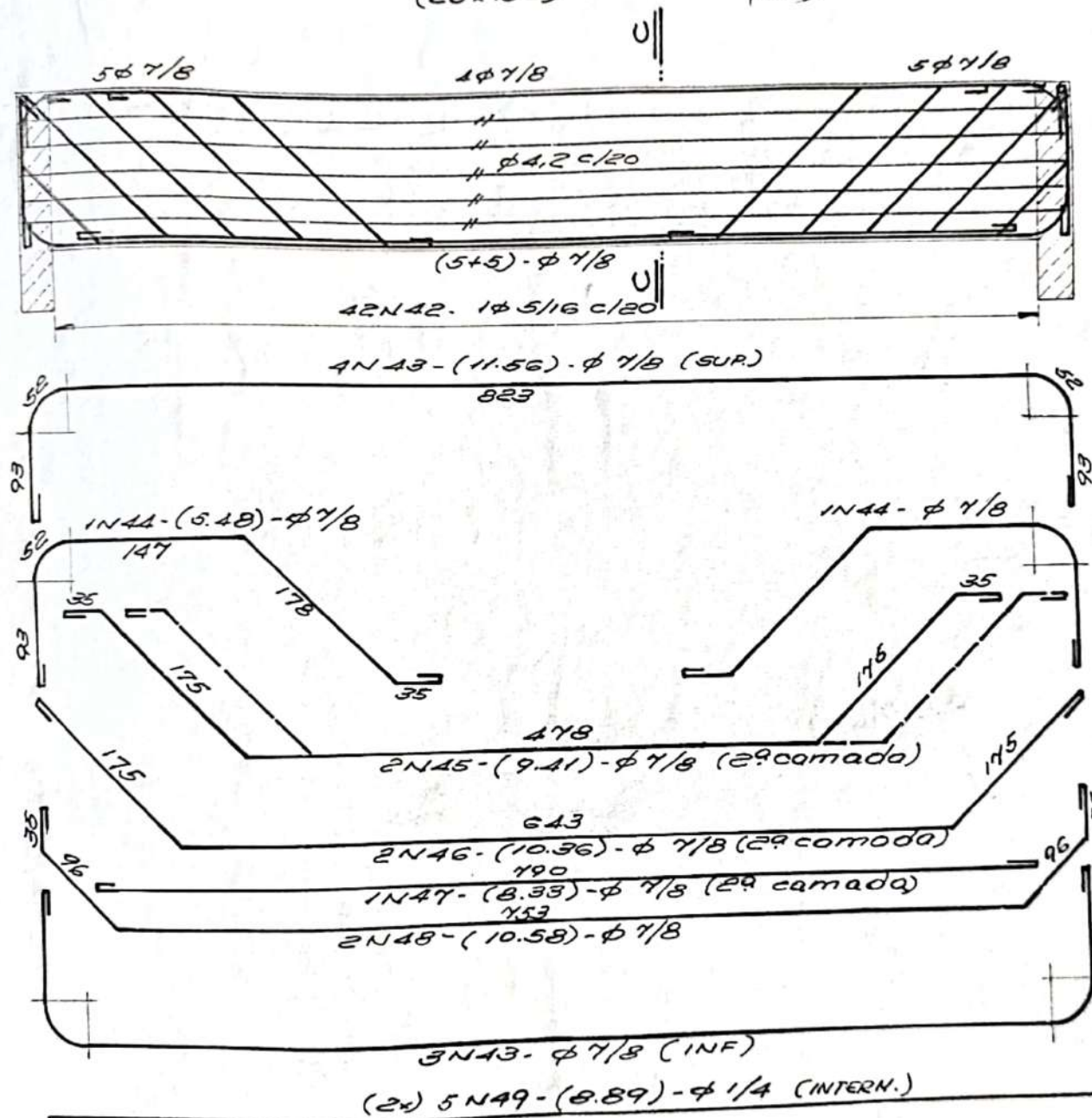


ELEVAÇÃO

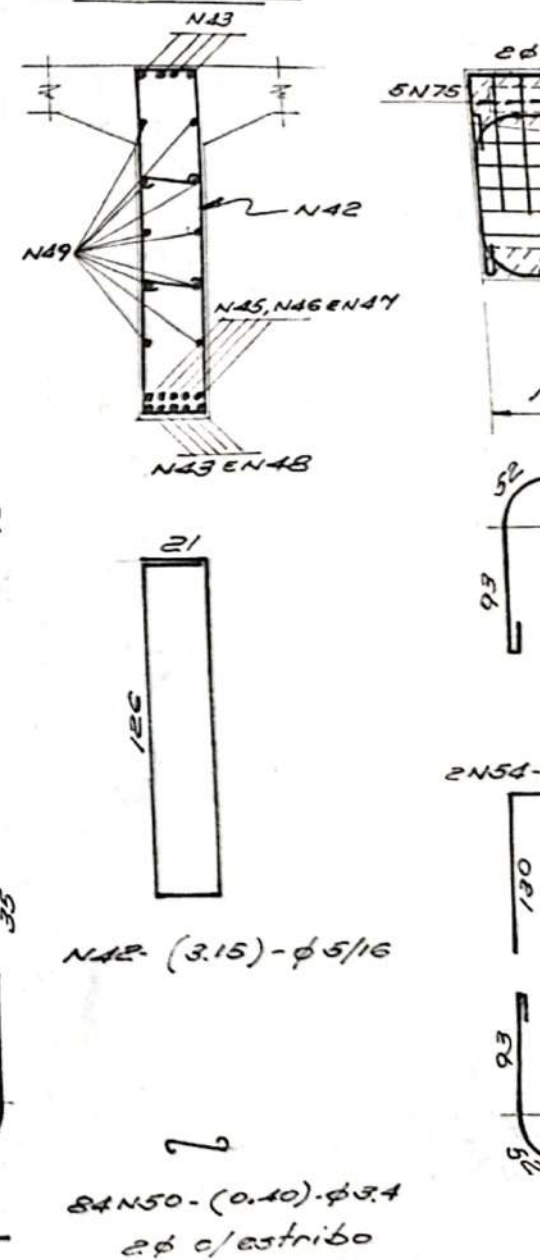
(4x)



ARMADURA DAS TRANSVERSINAS ESC 1:50
(25x130) (7x)



CORTE C-C ESC 1:25



ARMADURA DAS CORTINAS (2x) (25x130)

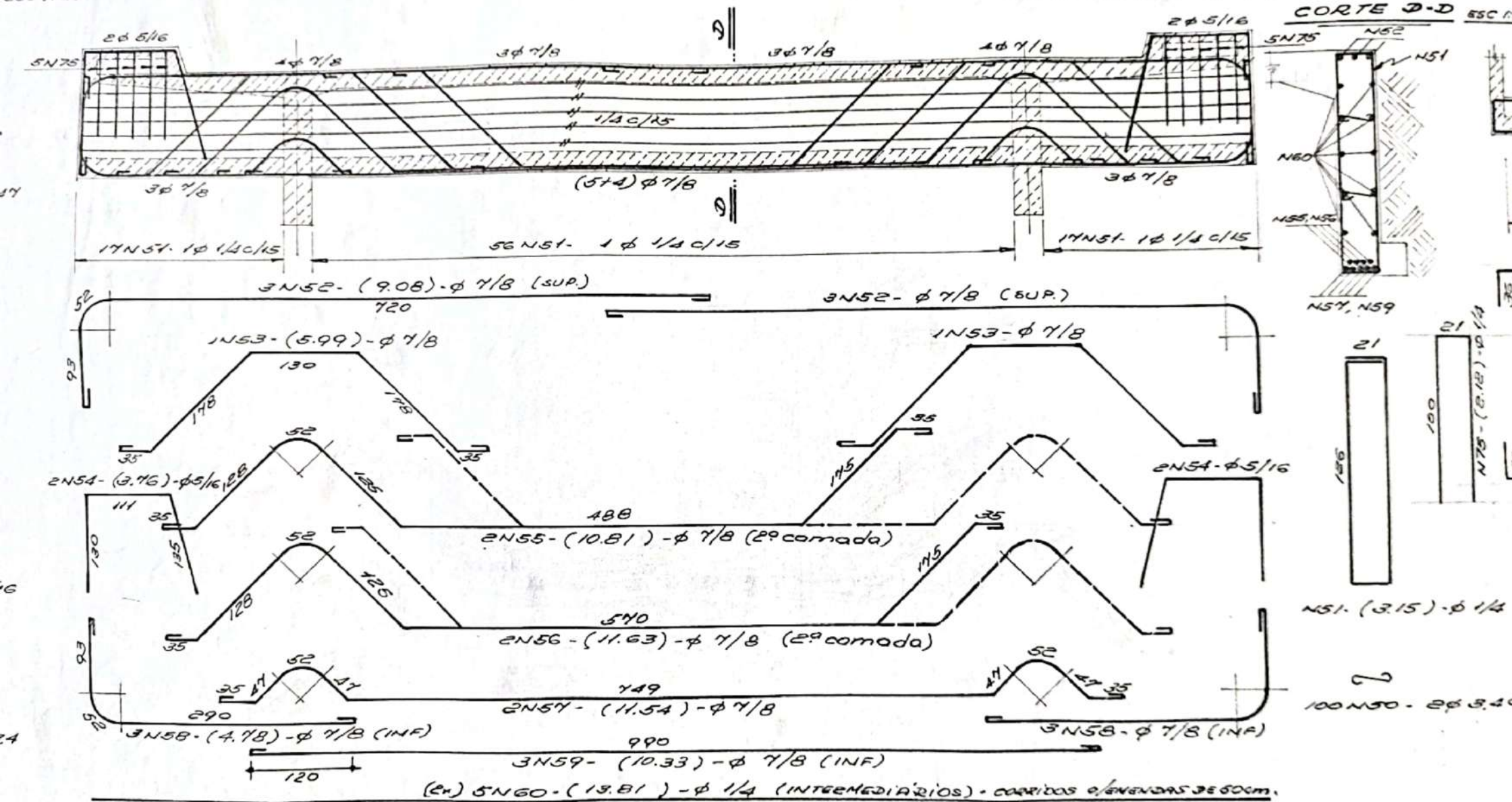
ESC 1:50

6N39 - (0.91) - $\phi 1/4$ C/20

9N40 - (VOR 125 - 345) - $\phi 1/4$ C/20

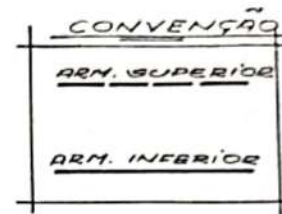
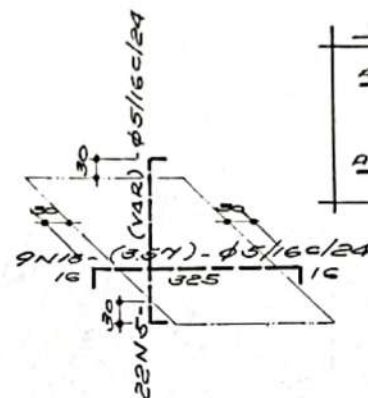
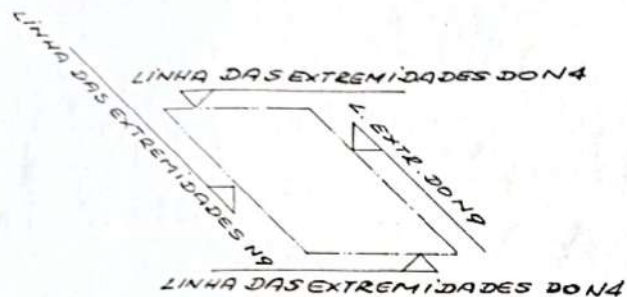
CORTE D-D ESC 1:50

ESC 1:25



DETALHE DA REGIÃO DO REFÓRÇO (8x)

alternados c/12
K



NOTAS:-

- 1) VERIFICAR MEDIDAS NA OBRA.
- 2) AÇO: CA-50 (Poleg.)
CA-60 (mm).

N12 - (VAR) - Ø 1/2 (espaçamento c/12
(RADIAIS) no eixo da viga principal)

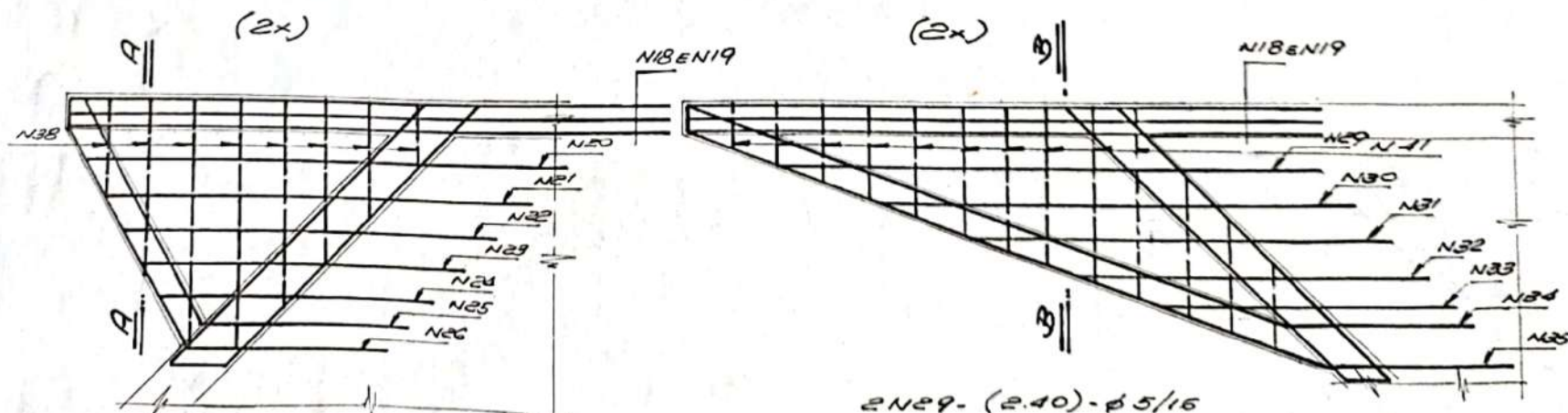


DURA DAS ABAS ESC 1:25

RESUMO DO AÇO

	3.4 mm	6.4 mm	1/4"	5/16"	1/2"	7/8"
SOMA	811.20	1264.00	11.956,58	3.288,98	8.950,46	1.514,55
PESO kg	68.00	319,00	2.966,00	1277,00	8.897,00	4.609,00
PESO TOTAL: 18.126,00 Kg (SEM PERDAS)						

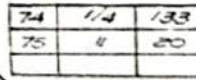
PLANTAS



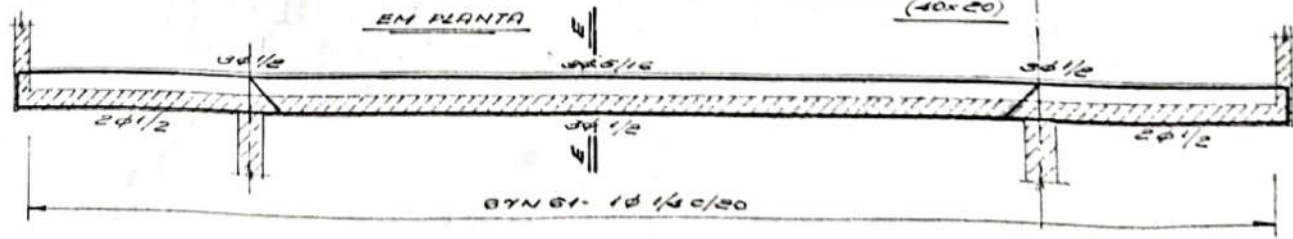
2N29 - (2.40) - Ø 5/16

ARMADURA DAS ABAS ESC 1:25

PLANTAS



CORTE D-D ESC 1:25



9- 1φ 1/4 c/20

9N40- 1φ 1/4 c/20

2-D ESC 1:25

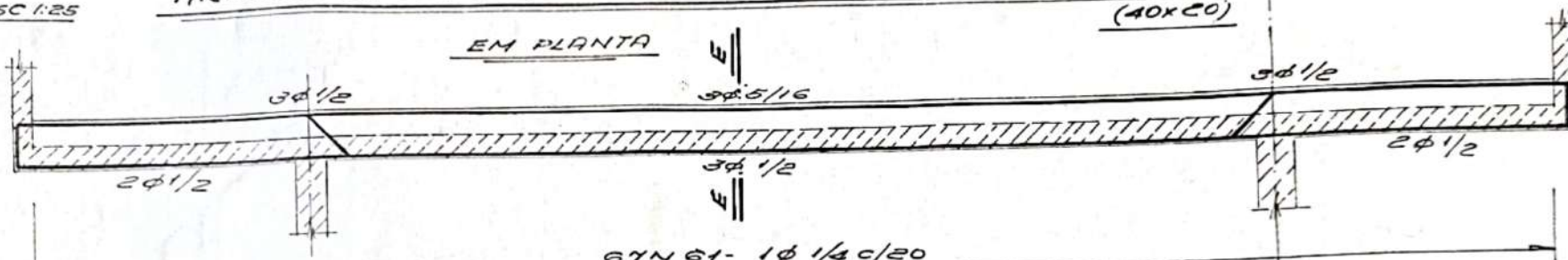
ARMADURA DA VIGUETA HORIZONTAL INFERIOR À CORTINA

ESC 1:50 (2x)

EM PLANTA

(40x50)

N51



3N62- (4.76) - φ 1/2 (SUP.)

440

2N63- (7.20) - φ 5/16 (SUP.)

3N62- φ 1/2 (SUP.)

1N64- (9.30) - φ 5/16 (SUP.)

100
21
N75- (2.12) - φ 1/4

25
51

791

1N65- (9.43) - φ 1/2

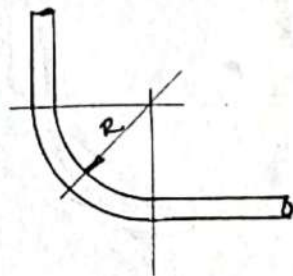
2N66- φ 1/2 (INF.)

2N66- (3.56) - φ 1/2 (INF.)

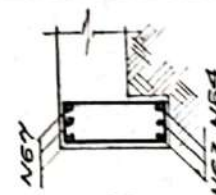
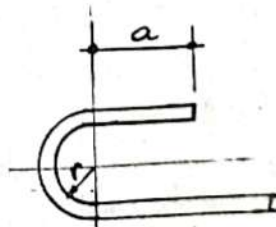
2N67- (9.50) - φ 1/2 (INF.)

)- φ 1/4

2φ 3.4 c/ estribo



φ	R	r	q
5/8	23	4.8	3.2
7/8	31	6.6	5.0



NG1- (1.20) - φ 1/4

CORTE E-E

ESC 1:25



P. A. A.
Engenheiro
PAULO
MANFR
O D E

RUA PADRE ANTONIO, 311

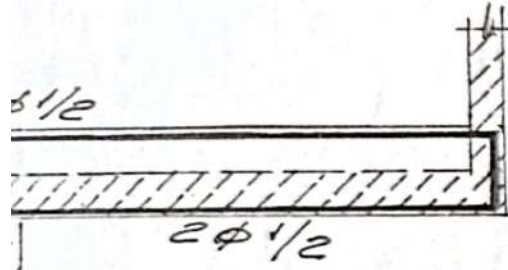
OBRA: PONTE

ARMADURA
LAVES, ABAS
E GUARDA-C

Cálculo.

25 ARMADURA DOS GUARDA-CORPOS

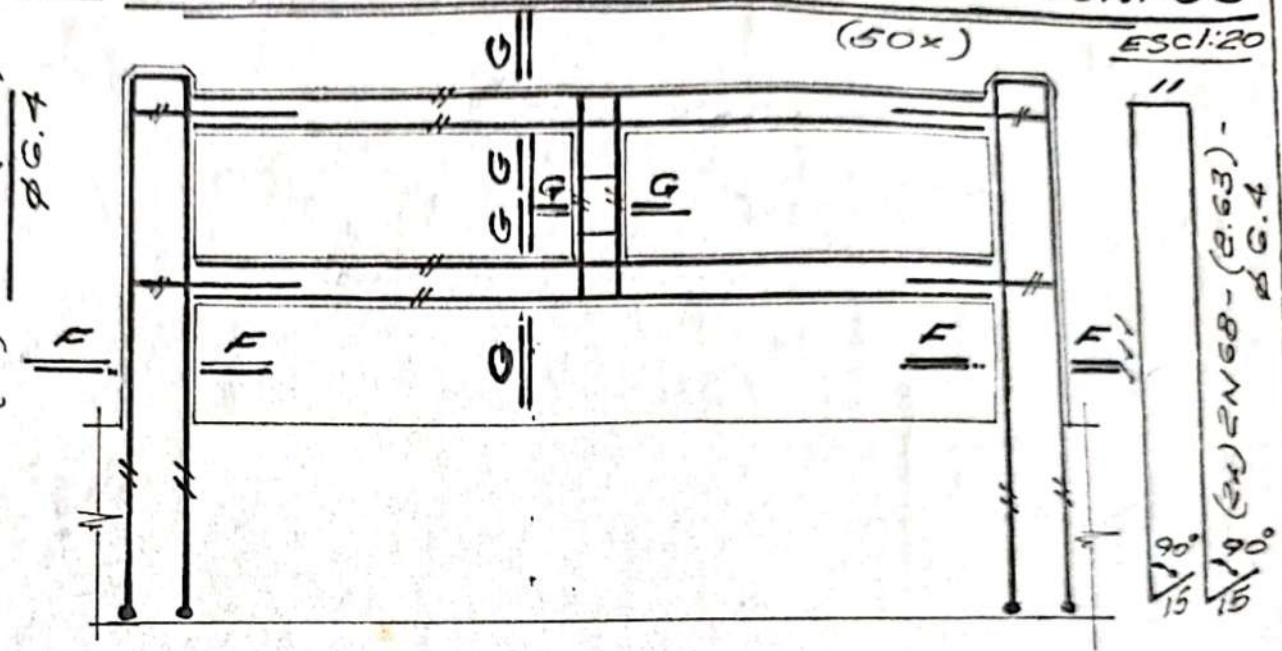
ESC 1:50 (2x)



62- $\phi 1/2$ (SUP.)

2N66- $\phi 1/2$ (INF)

(2x) 2N69-(0.41)- $\phi 6.4$



(50x)

ESC 1:20

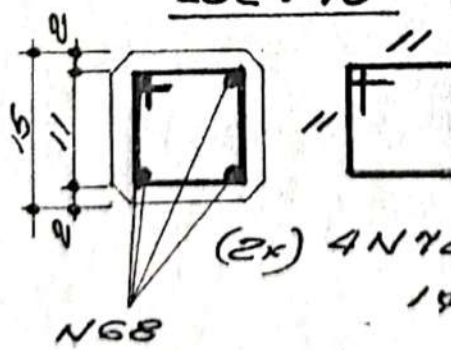
(4x) 2N70-(1.64)- $\phi 6.4$

(2x) 2N71-(0.30)- $\phi 1/2$

(2x) 2N71- $\phi 1/2$

CORTE F-F

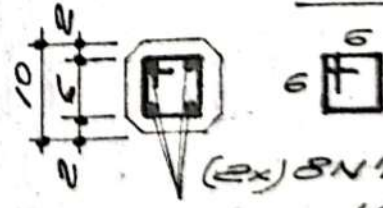
ESC 1:10



(2x) 4N72-(52).
1 $\phi 3.4C/20$

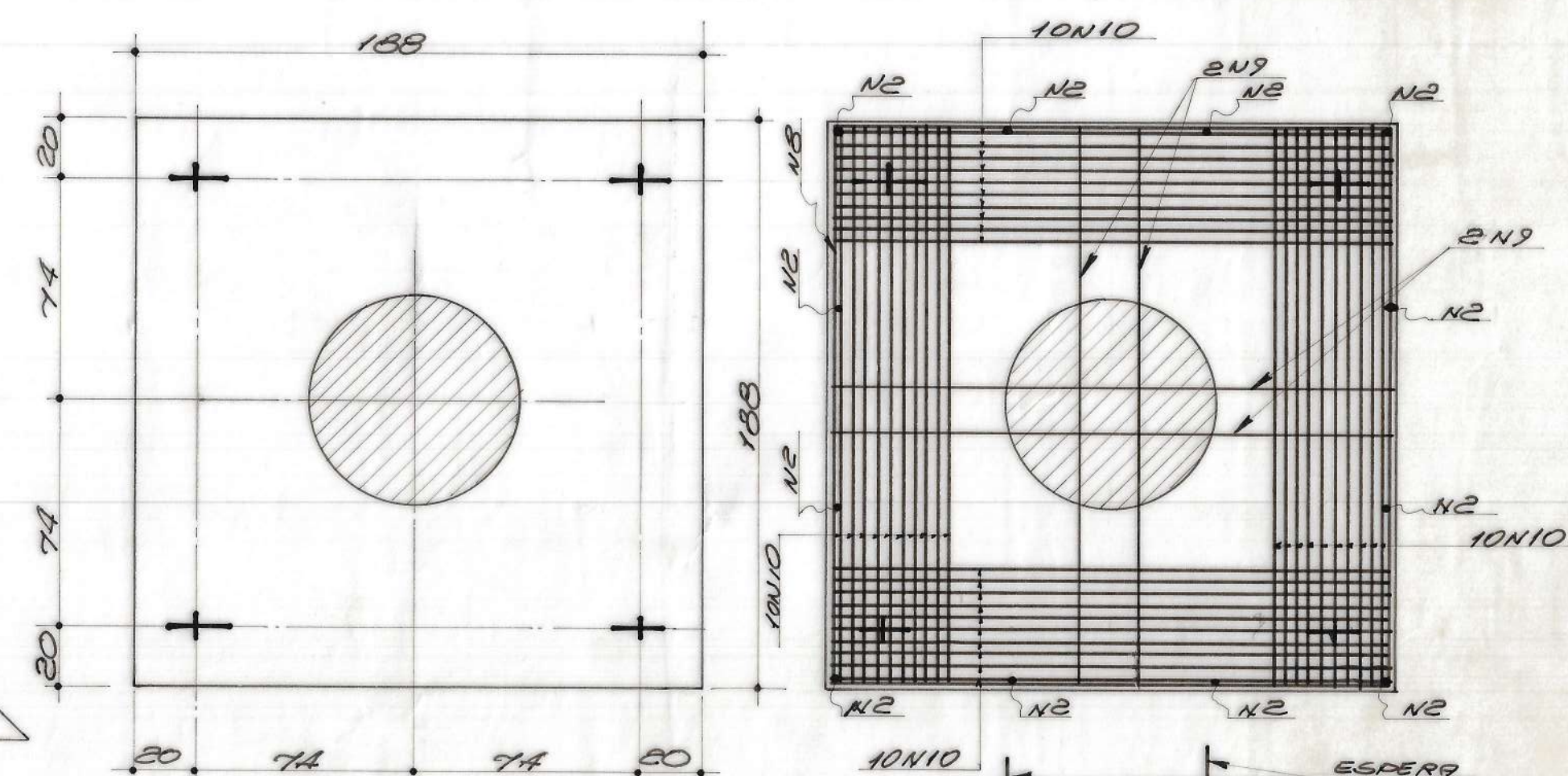
CORTE G-G

ESC 1:10



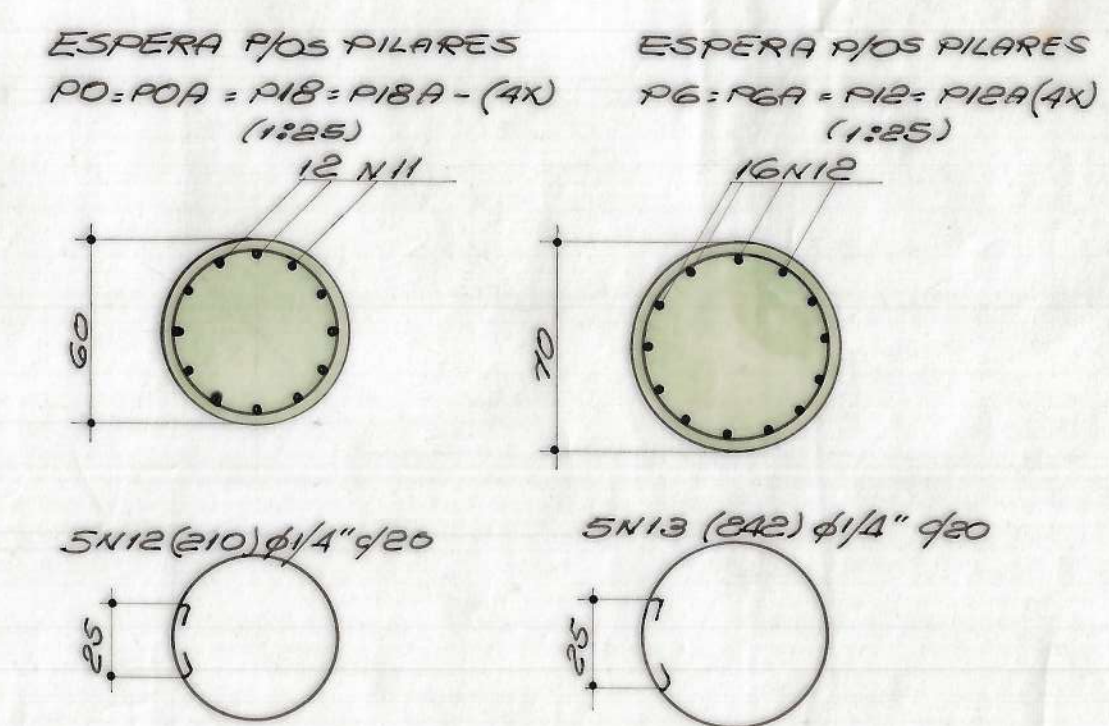
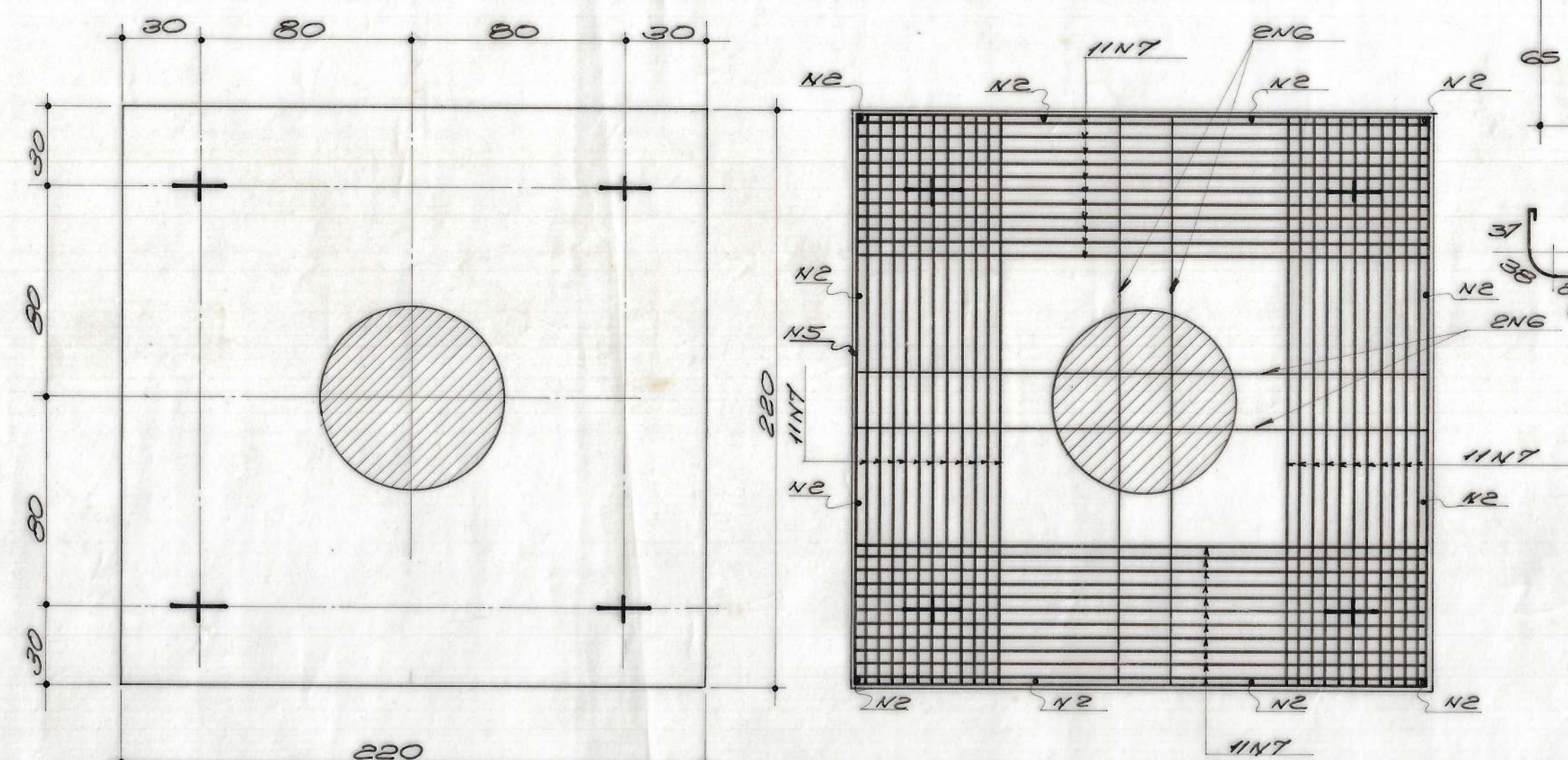
(2x) 8N73-(32)
N69, N70 1 $\phi 3.4C/20$

FÔRMA E ARMADURA DO BLOCO DE 4 ESTACAS
P/O PILAR PGA - (IX) - 1:20



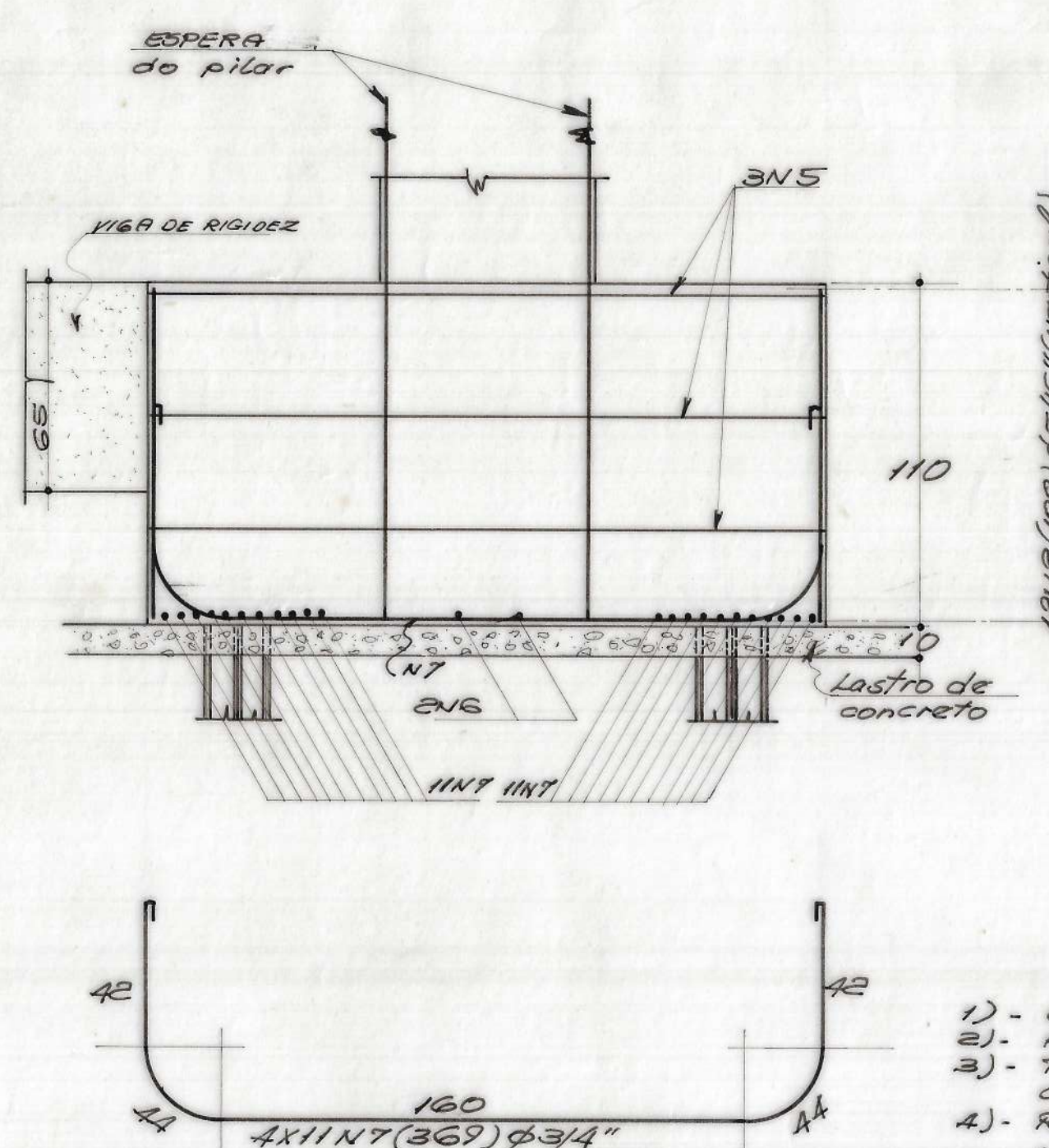
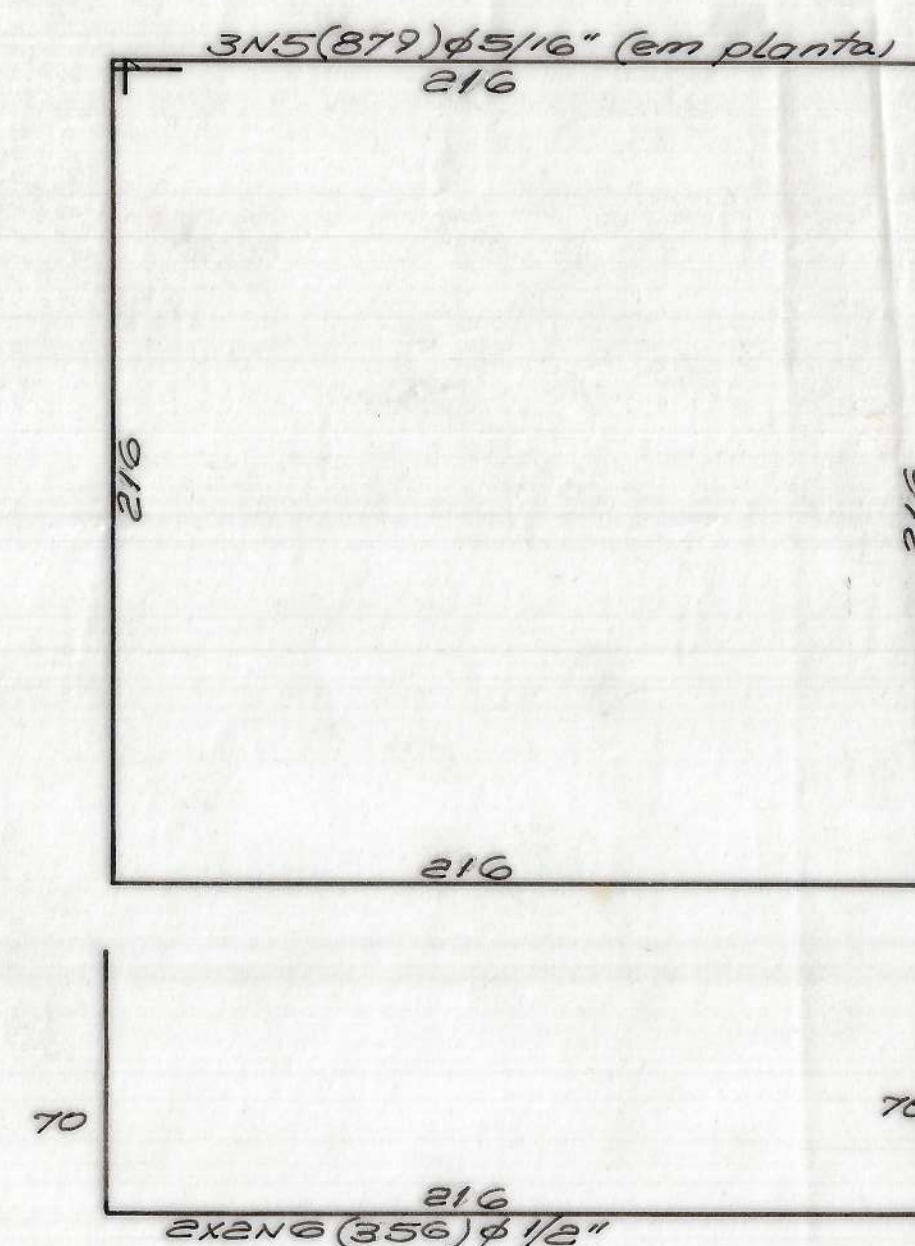
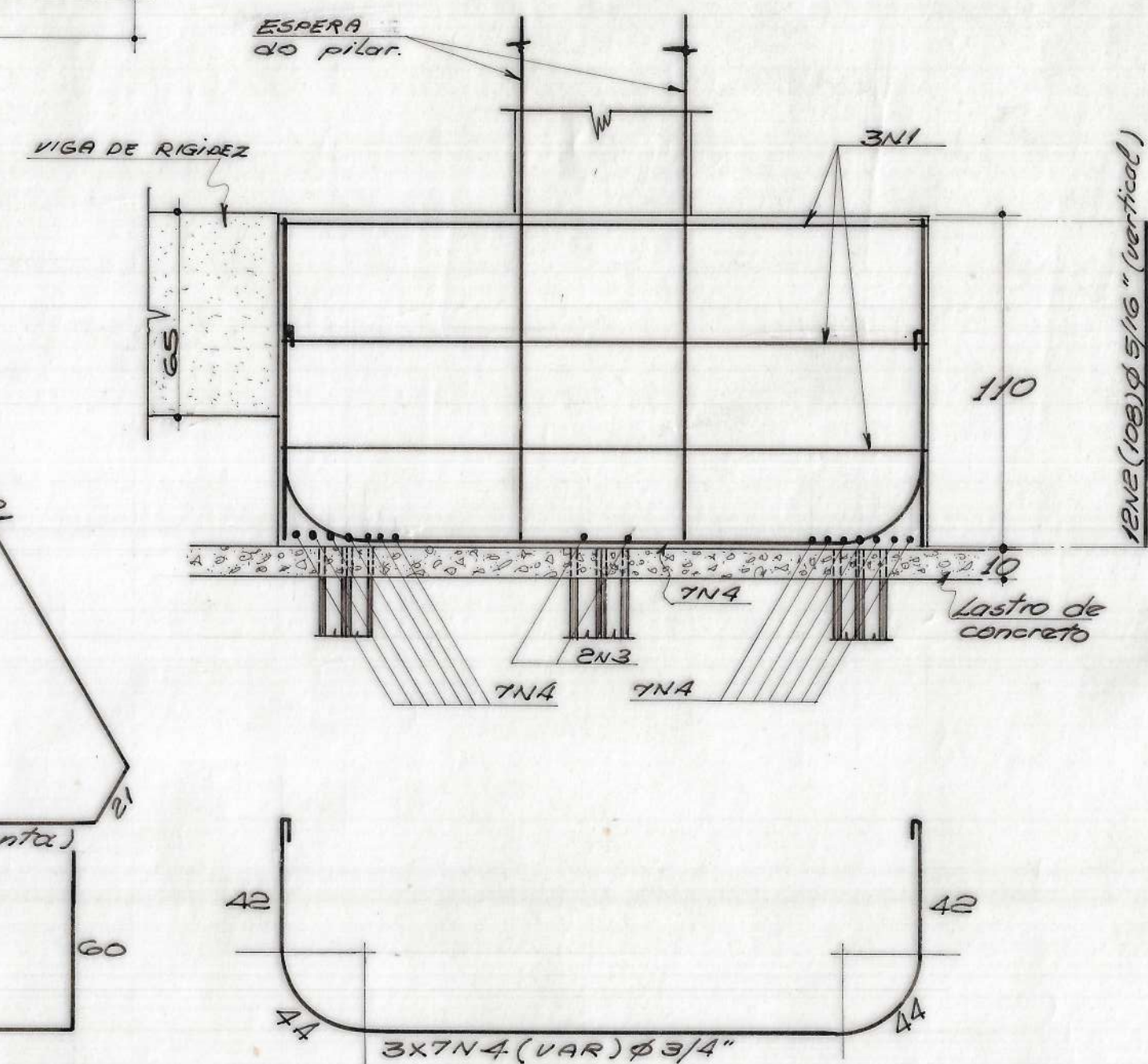
ARMAD. DA VIGA DE
RIGIDEZ (4X) - 1:25

FÔRMA E ARMADURA DOS BLOCOS DE 4 ESTACAS
P/OS PILARES - $P_6 = P_{12} = P_{18} - (3X) - 1:20$



Nº	D	Q	COMPAR UNIDAD
1	5/16	12	65
2	"	96	108
3	1/2	24	302
4	3/4	84	1478
5	5/16	9	87
6	1/2	12	350
7	3/4	132	368
8	5/16	3	753
9	1/2	4	323
10	3/4	40	338
11	5/8	112	88
12	1/4	20	810
13	"	20	248
14	5/8	40	105
15	5/16	24	92
16	"	248	163

Ø	1/4"	5/16"	1/2"	5/8"	3/4"
SOMIA M.	90,40	953,72	128,68	737,04	294,68
PESO Kg	23,00	359,00	128,00	1.144,00	2.067,00
PESO TOTAL = 3.721,00 (sem juros)					



NOTAS:

- 1) - concreto adotado $R = 150 \text{ kg/cm}^2$
- 2) - Aço empregado CA-50 (pósgarda)
- 3) - Todas as dimensões devem ser conferidas na obra.
- 4) - Raios de curvatura para $\phi 5/8"$
vide folha n.º 4 e para $\phi 3/4"$
OBSERVAR: $R = 27 = r \cdot 3,7 = A = 42$