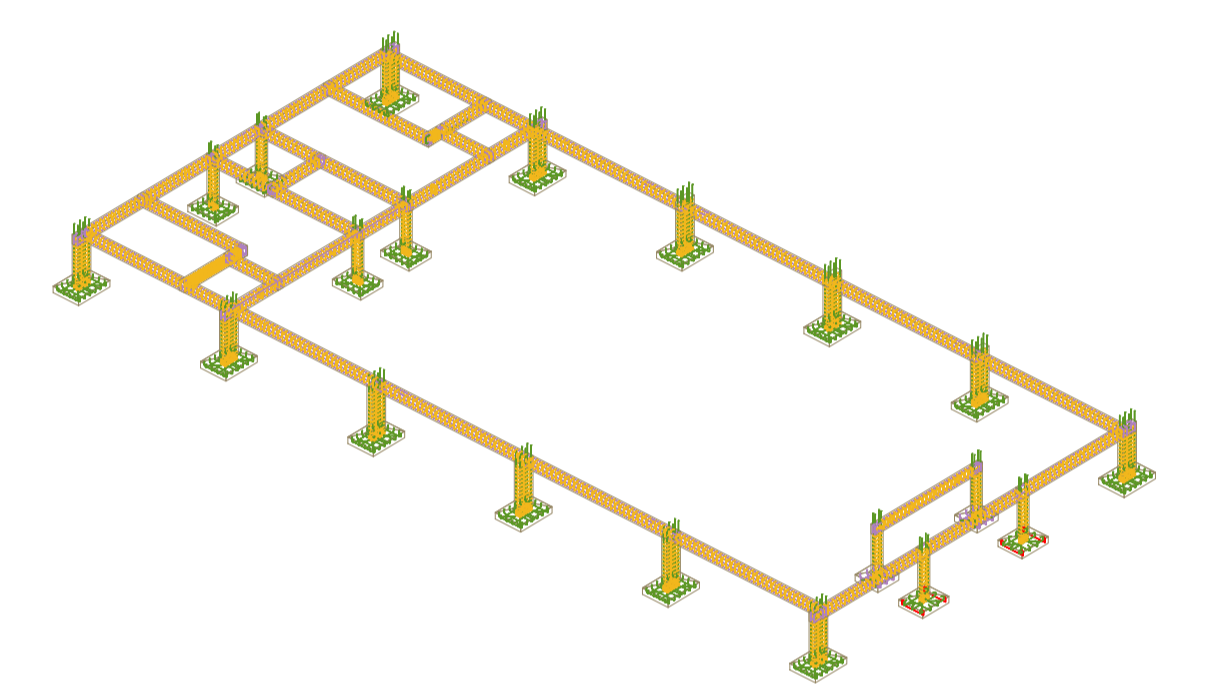


ELEMENTO	Pos.	DIAM.	Q.	DOB. (CM)	RETA (CM)	DOB. (CM)	COMP. (CM)	TOTAL (CM)	CA-50 (KG)	CA-60 (KG)
P1=P2=P3=P4=P5 P6=P15=P16=P17 P18=P19=P20	1	Ø10	6	13	81	13	107	642	4.0	
	2	Ø10	4	12	111	12	135	540	3.3	
	3	Ø10	6	30	207	128	237	1422	8.8	
	4	Ø5	3				128	384		0.6
TOTAL+10%:									17.7	0.7
(x2):									212.4	8.4
P7=P13	5	Ø8	3	13	71	13	97	291	1.1	
	6	Ø8	3	12	72	12	96	288	1.1	
	7	Ø10	4	30	207	128	237	948	5.8	
	8	Ø5	3				78	234		0.4
TOTAL+10%:									8.8	0.4
(x2):									17.6	0.8
P8=P14	9	Ø10	4		118		118	472	2.9	
	10	Ø10	3	11	111	11	133	399	2.5	
	11	Ø10	4	30	207	128	237	948	5.8	
	12	Ø5	3				78	234		0.4
TOTAL+10%:									12.3	0.4
(x2):									24.6	0.8
P9=P10=P11=P12	13	Ø10	5	13	76	13	102	510	3.1	
	14	Ø10	4	12	91	12	115	460	2.8	
	15	Ø10	4	30	207	128	237	948	5.8	
	16	Ø5	3				78	234		0.4
TOTAL+10%:									12.9	0.4
(x4):									51.6	1.6
TOTAL:									306.2	11.6

RESUMO AÇO FUNDAÇÃO	COMP. TOTAL (M)	PESO+10% (KG)	TOTAL
CA-50	Ø8	11.6	5
CA-50	Ø10	444.5	301
CA-50	Ø5	64.8	11
TOTAL			317



**COBRIMENTOS MÍNIMOS**

LAJE E ESCADA: 2,5cm  
 PILAR: 2,5cm  
 PILAR (CONTATO COM O SOLO): 2,5cm  
 SAPATA: 4cm  
 VIGA: 2,5cm

**CONCRETO**  
 fck = 25 MPa

AÇO: CA-50 E CA-60

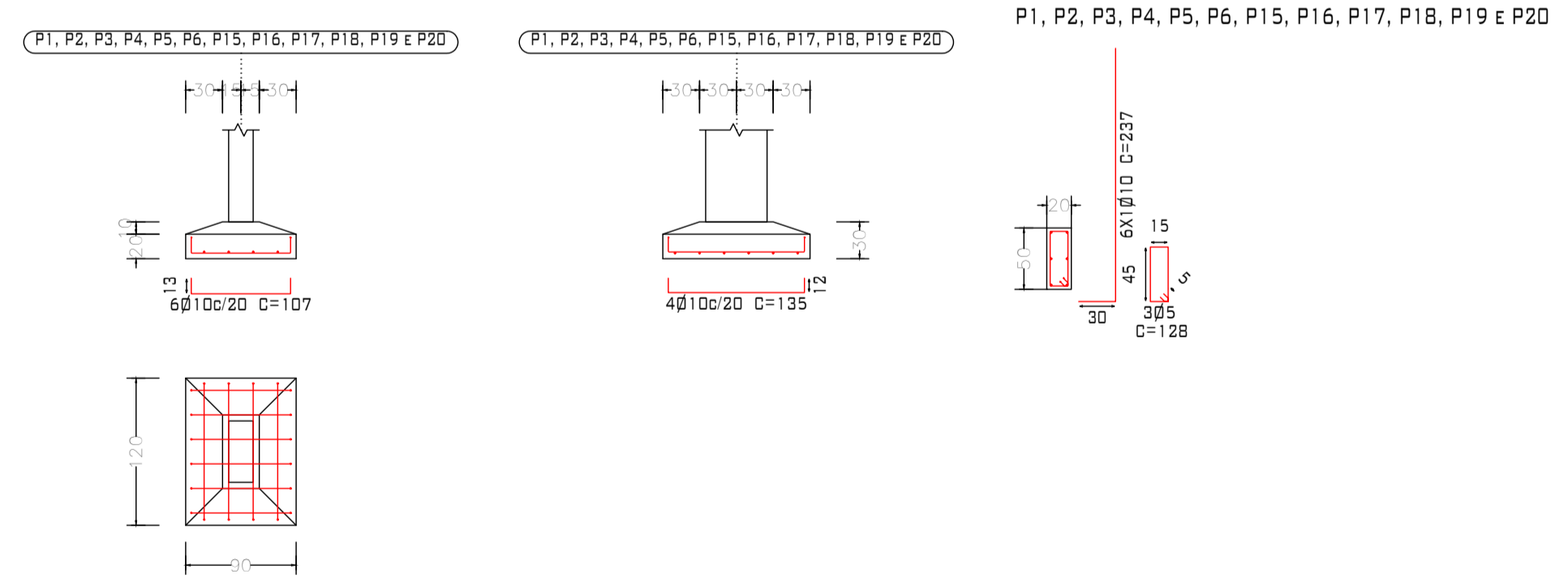
**PROJETO ESTRUTURAL**



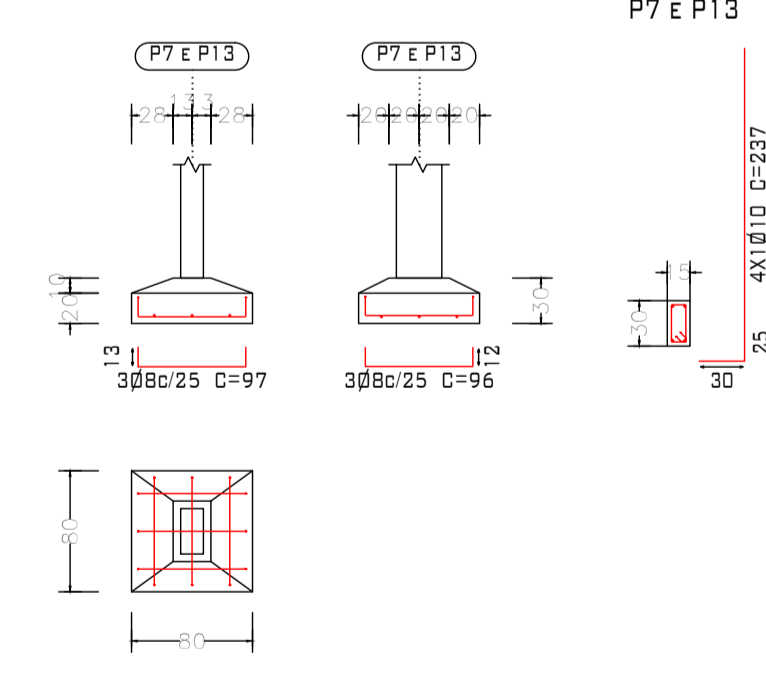
IDENTIFICAÇÃO			
CL	PJ	VR	CT
MA	ES	00	01

Responsável Técnico		_____	
Área:	Obra: APAE - CAMPINA GRANDE		
	Local: EUTICIA VITAL RIBEIRO, CATOLE		
Assunto: PROJETO ESTRUTURAL			Folha:01/08
Escala: INDICADA	Data:	Calculista CLAUDECI TOMÉ FILHO Estrutural: CREA-PB 162040756-6	
Proprietário: APAE	<b>Estrutural</b>		

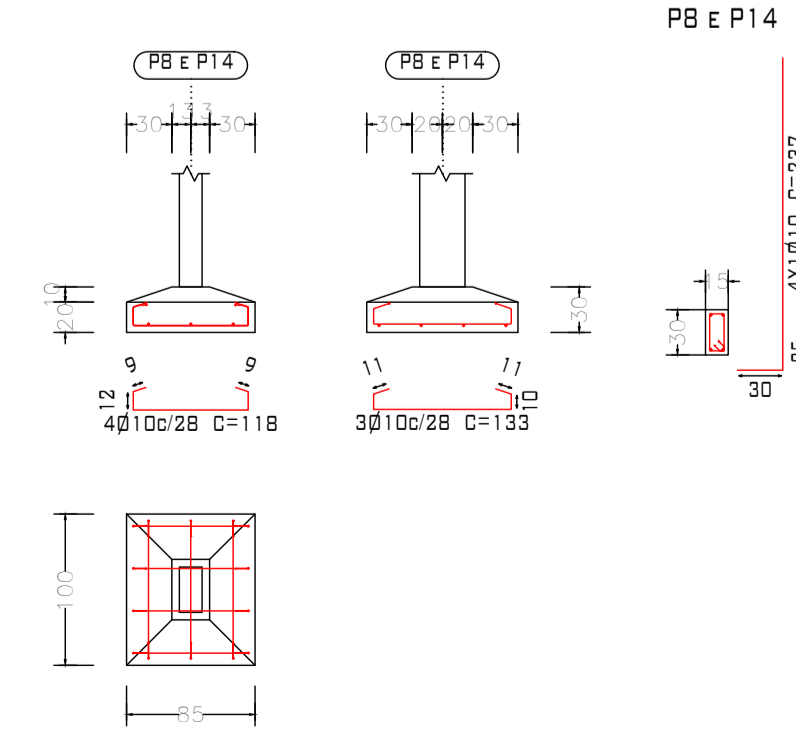
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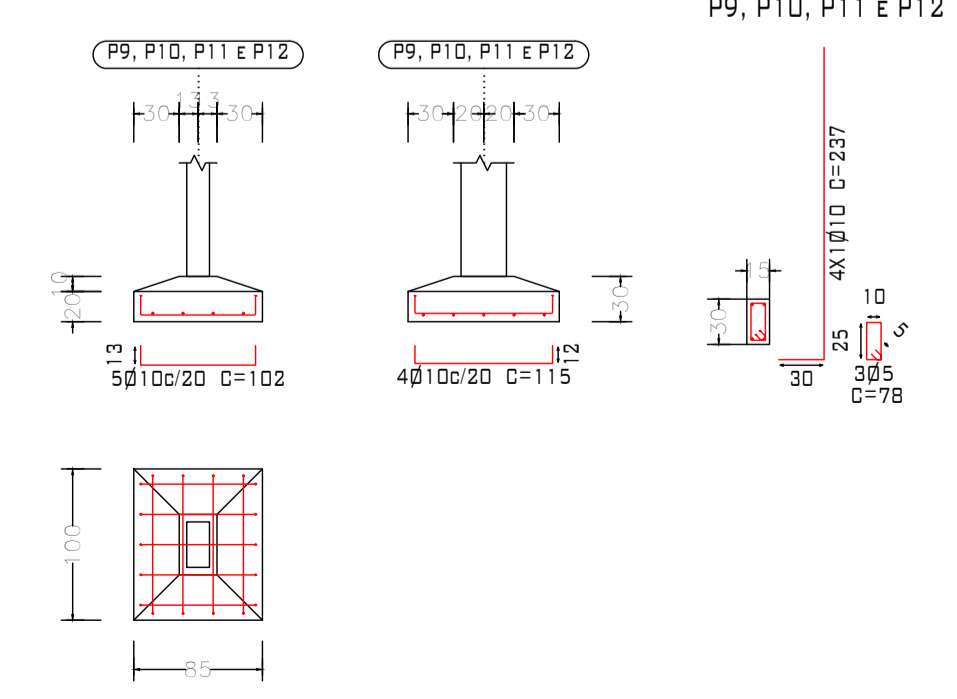
P7 e P13



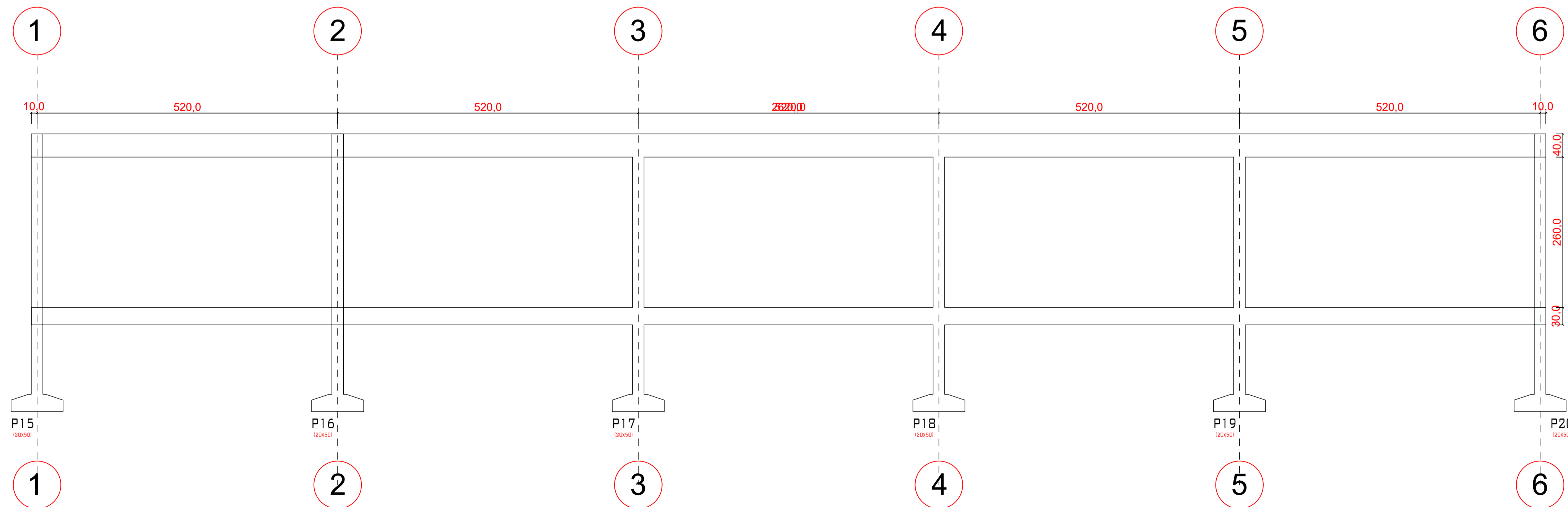
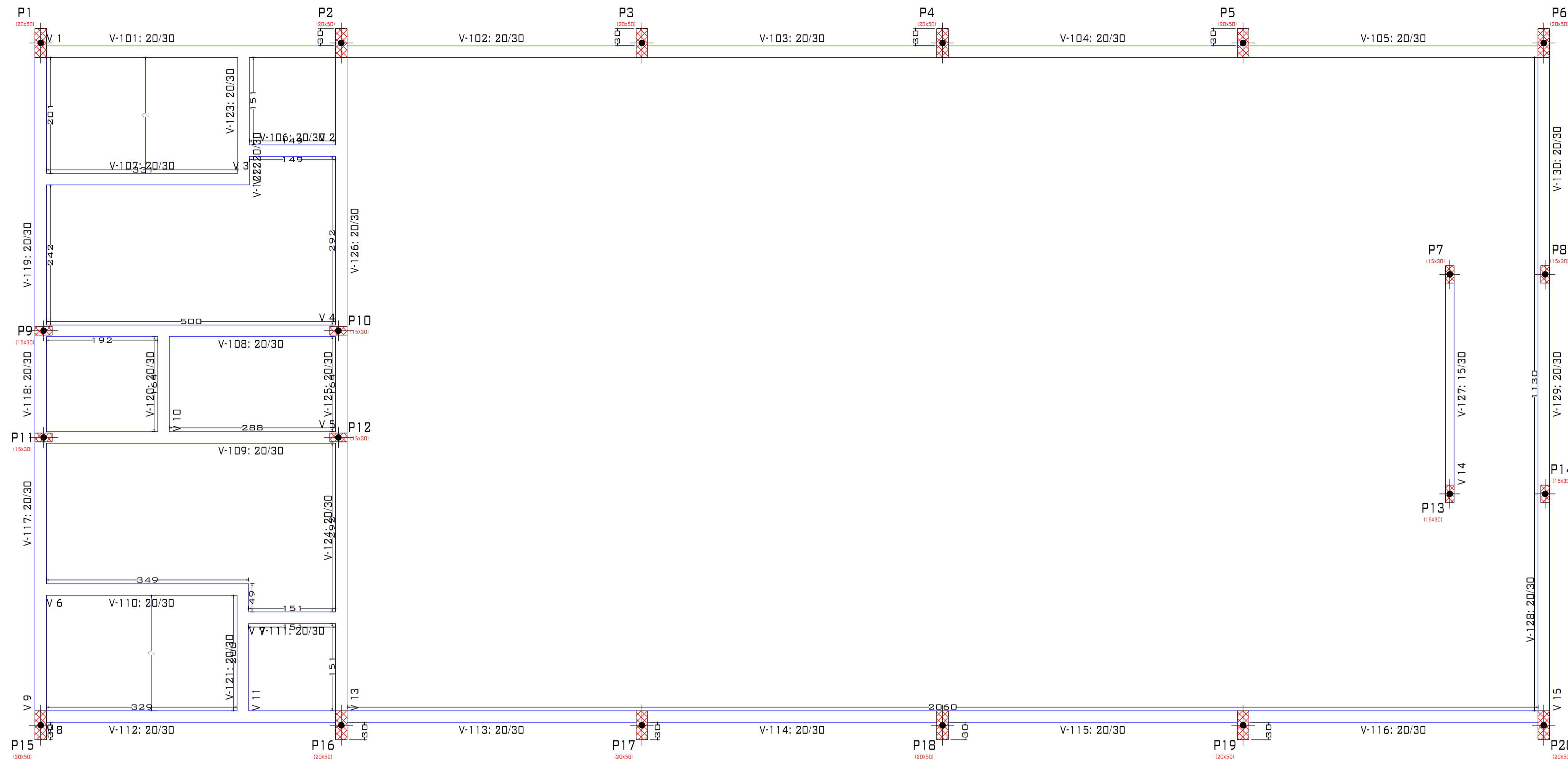
P8 e P14



P9, P10, P11 e P12



ELEMENTO	BALDRAME			
	FÓRMAS (M2)	SUPERFÍCIE (M2)	VOLUME (M3)	BARRAS (KG)
VIGAS	56.61	22.16	7.100	340
PILARES	28.80	-	11.870	52
TOTAL	-	22.16	8.970	392
INDICES (POR M2)	-	-	0.378	16.53
SUPERFÍCIE TOTAL: 23.72 M2				



### COBRIMENTOS MÍNIMOS

LAJE E ESCADA: 2,5cm  
 PILAR: 2,5cm  
 PILAR (CONTATO COM O SOLO): 2,5cm  
 SAPATA: 4cm  
 VIGA: 2,5cm

CONCRETO  
 $f_{ck} = 25$  MPa

AÇO: CA-50 E CA-60

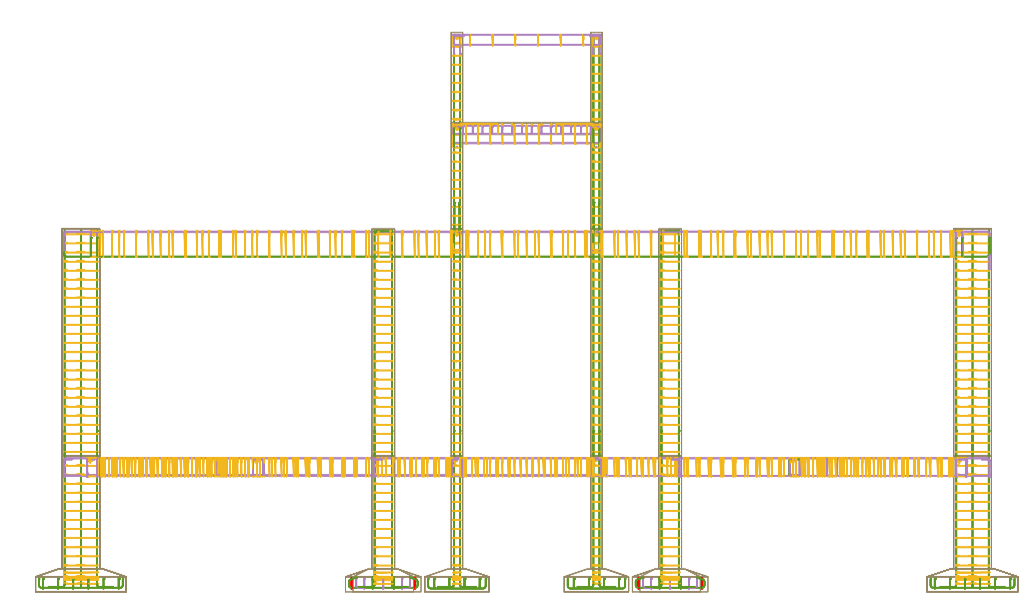
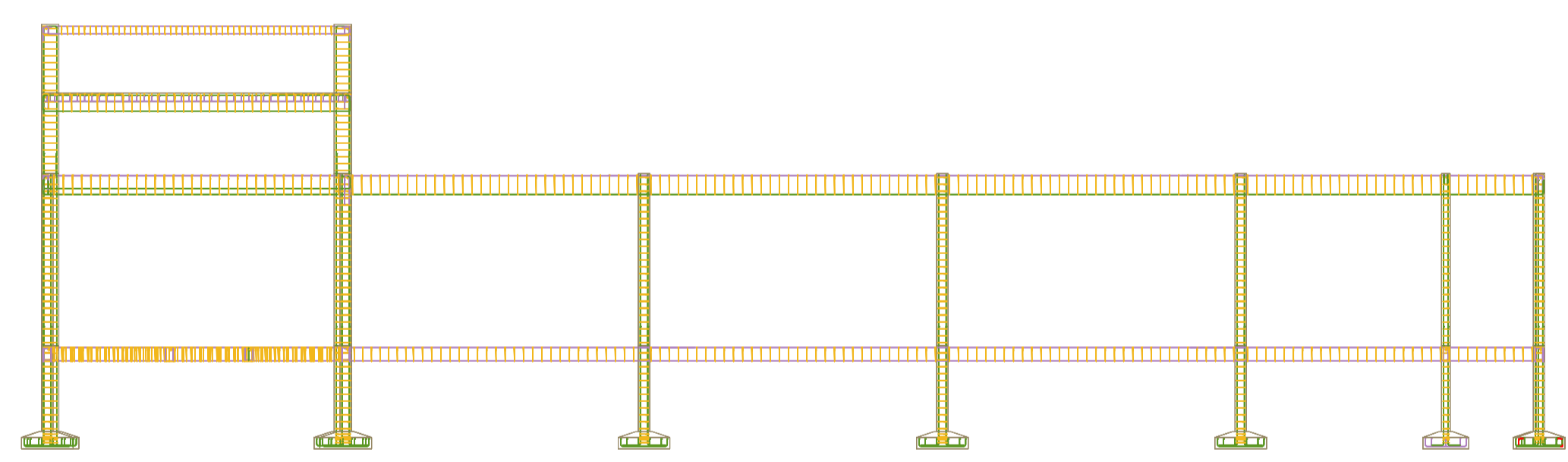
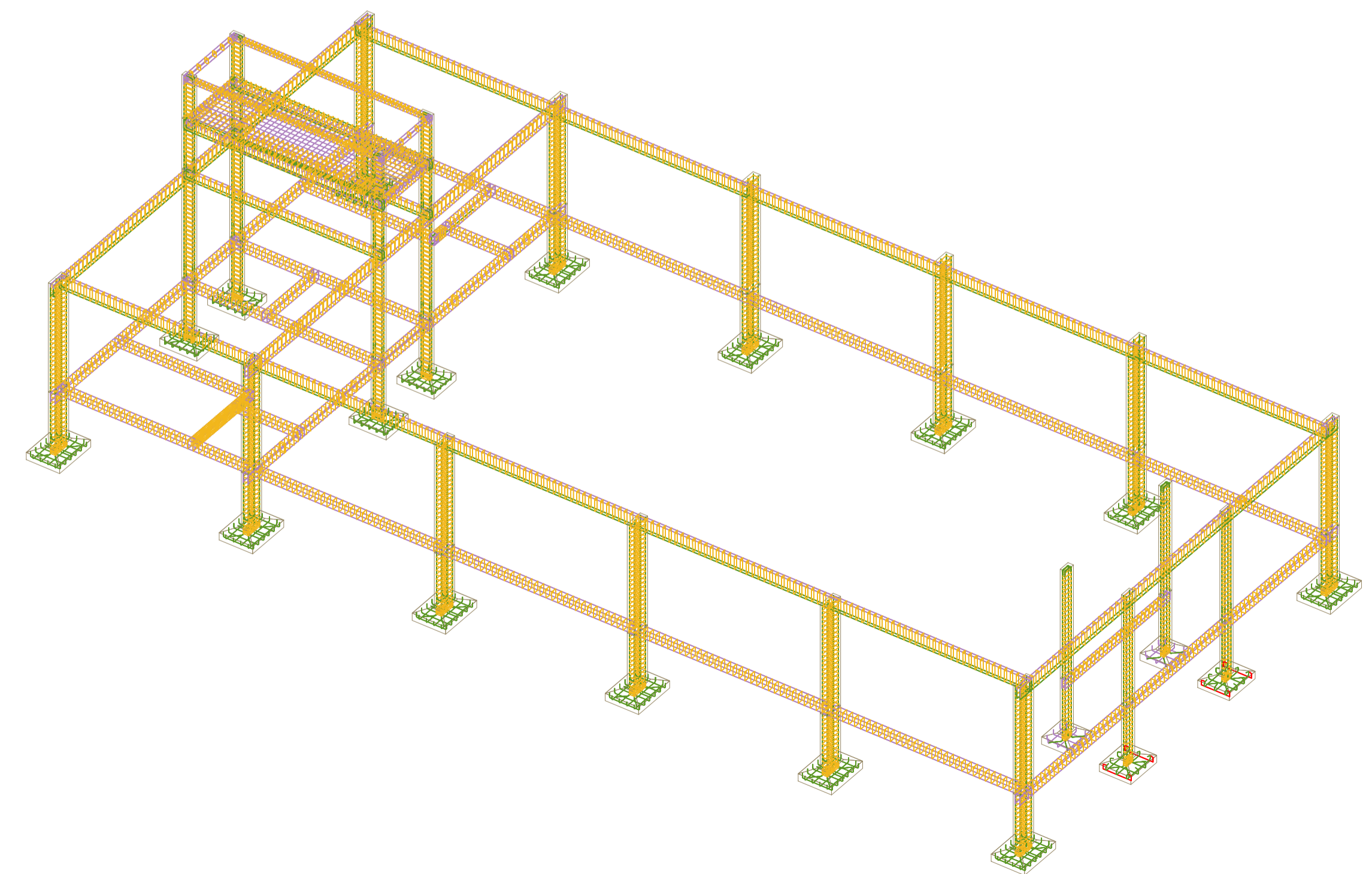
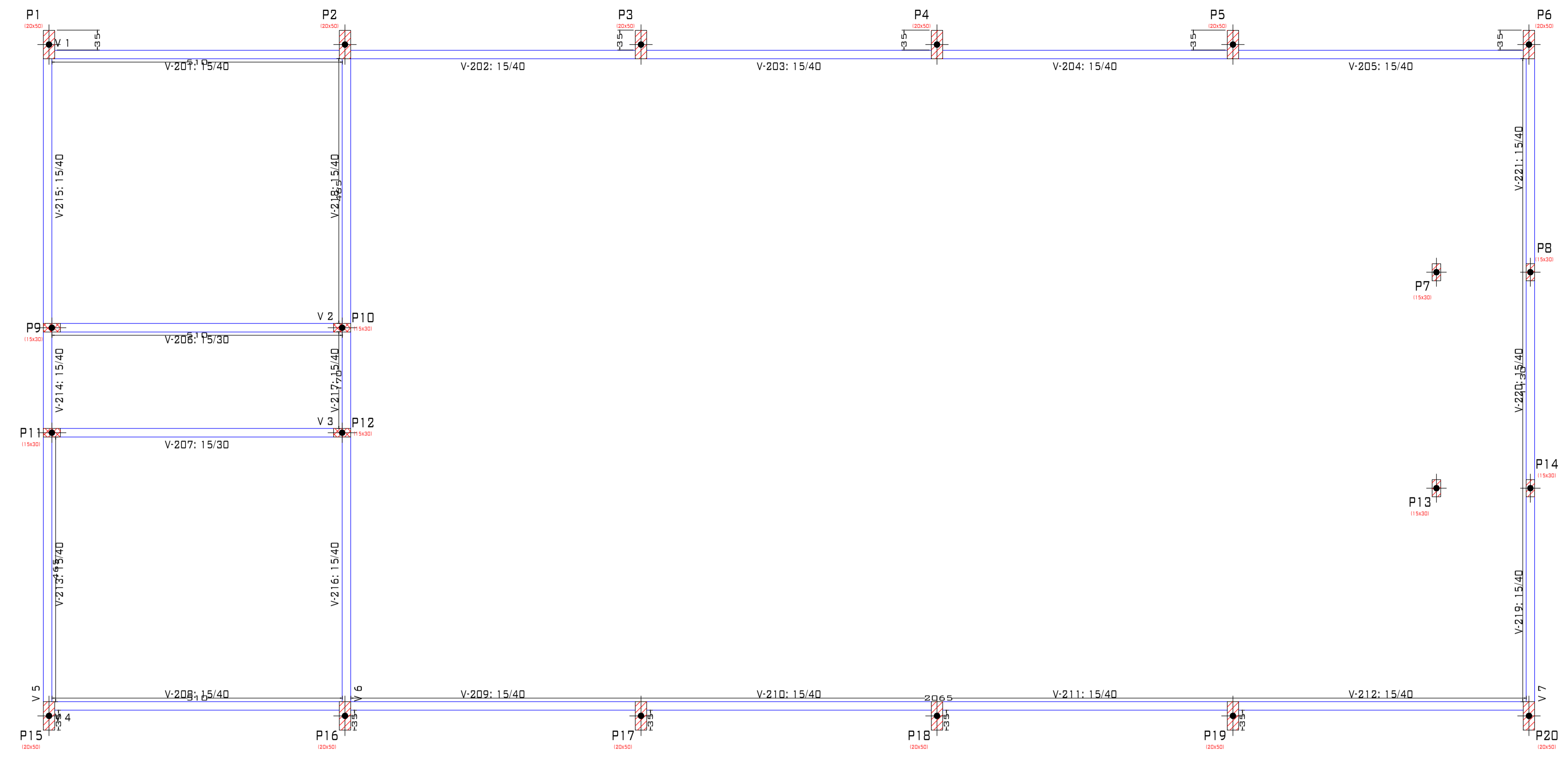
### PROJETO ESTRUTURAL



IDENTIFICAÇÃO			
CL	PJ	VR	CT
MA	ES	00	01

Área:	Obra: APAE - CAMPINA GRANDE	
	Local: EUTICIA VITAL RIBEIRO, CATOLE	
Assunto: PROJETO ESTRUTURAL	Folha: 02/08	
Escala: INDICADA	Data:	Calculista: CLAUDECI TOMÉ FILHO Estrutural: CREA-PB 162040756-6
Proprietário: APAE	<b>Estrutural</b>	

COBERTA				
ELEMENTO	FÓRMAS (M2)	SUPERFÍCIE (M2)	VOLUME (M3)	BARRAS (KG)
VIGAS	71,91	13,84	5,850	327
PILARES	63,12	-	4,090	324
TOTAL	-	13,84	9,940	651
ÍNDICES (POR M2)	-	-	0,649	42,52
SUPERFÍCIE TOTAL:	15,31 M2			



### COBRIMENTOS MÍNIMOS

LAJE E ESCADA: 2,5cm  
 PILAR: 2,5cm  
 PILAR (CONTATO COM O SOLO): 2,5cm  
 SAPATA: 4cm  
 VIGA: 2,5cm

CONCRETO  
 $f_{ck} = 25$  MPa  
 AÇO: CA-50 E CA-60

### PROJETO ESTRUTURAL



IDENTIFICAÇÃO			
CL	PJ	VR	CT
MA	ES	00	01

Responsável Técnico \_\_\_\_\_

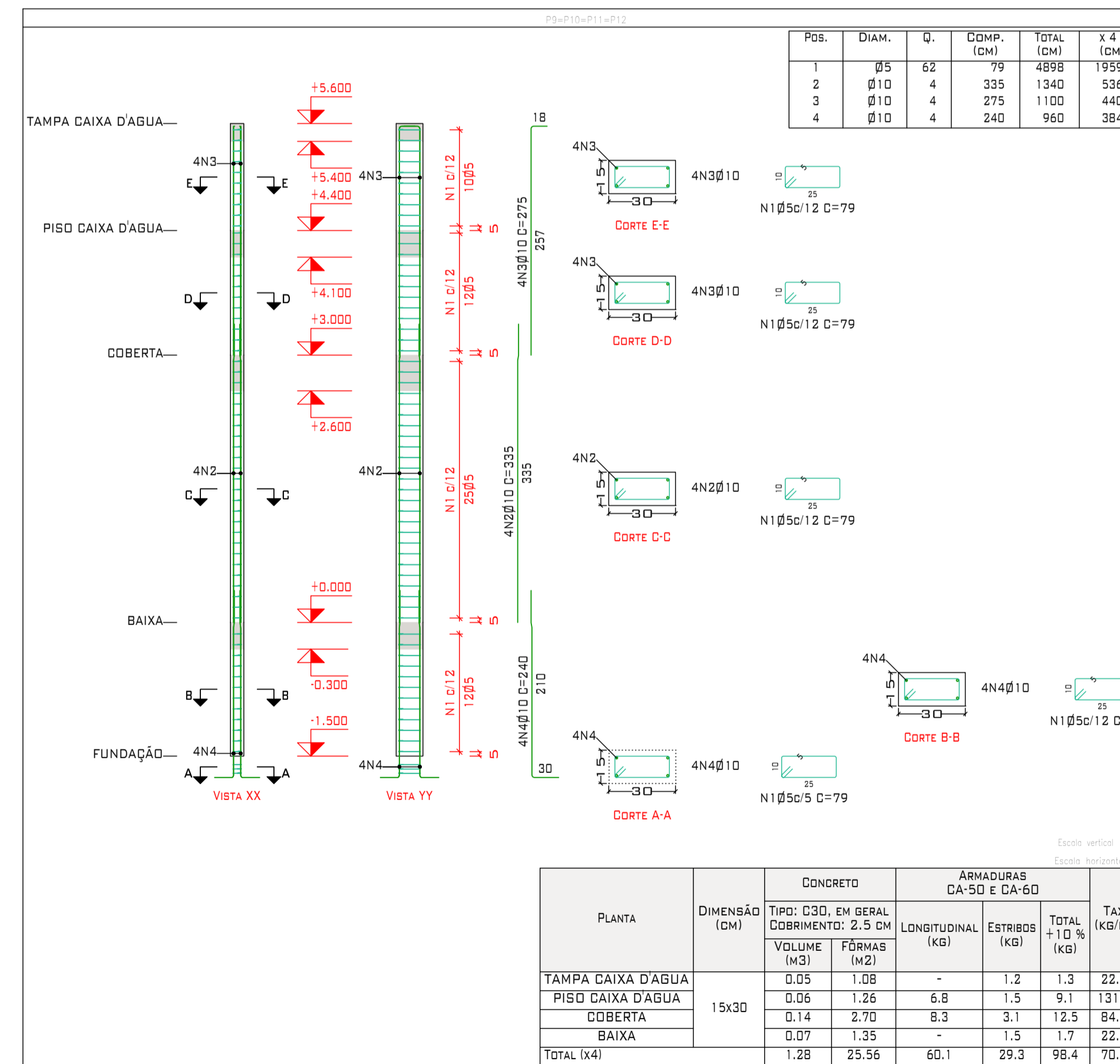
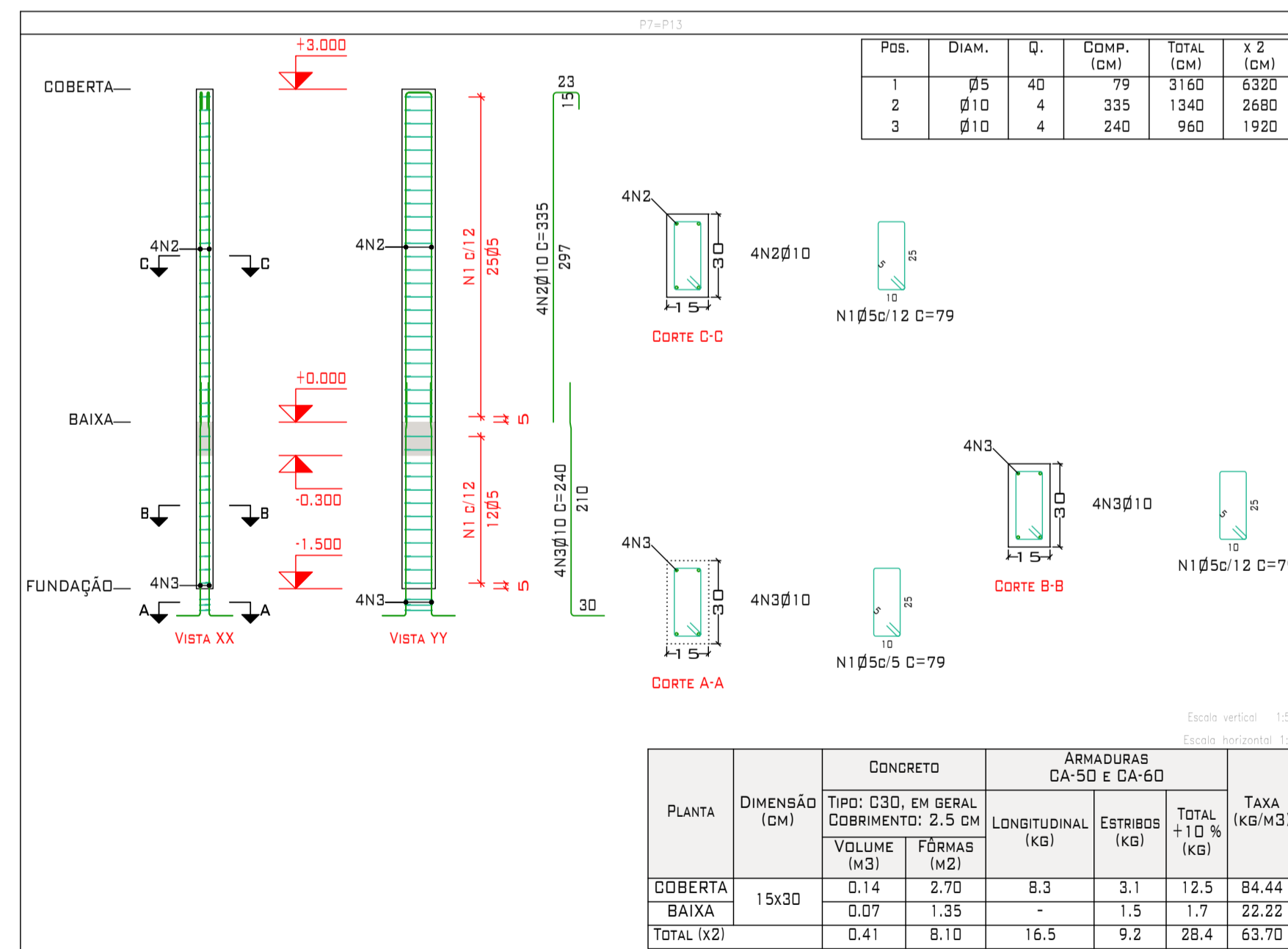
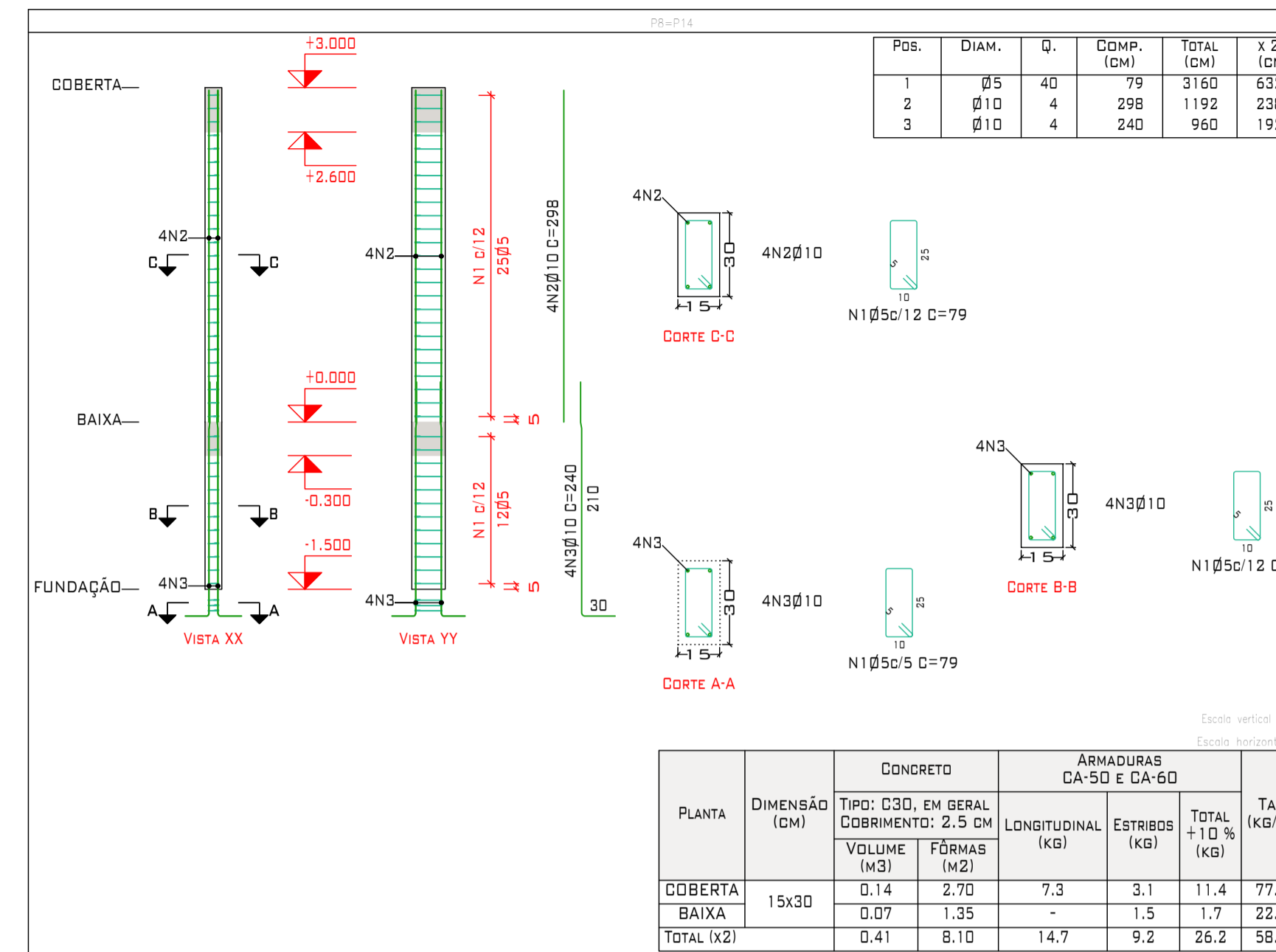
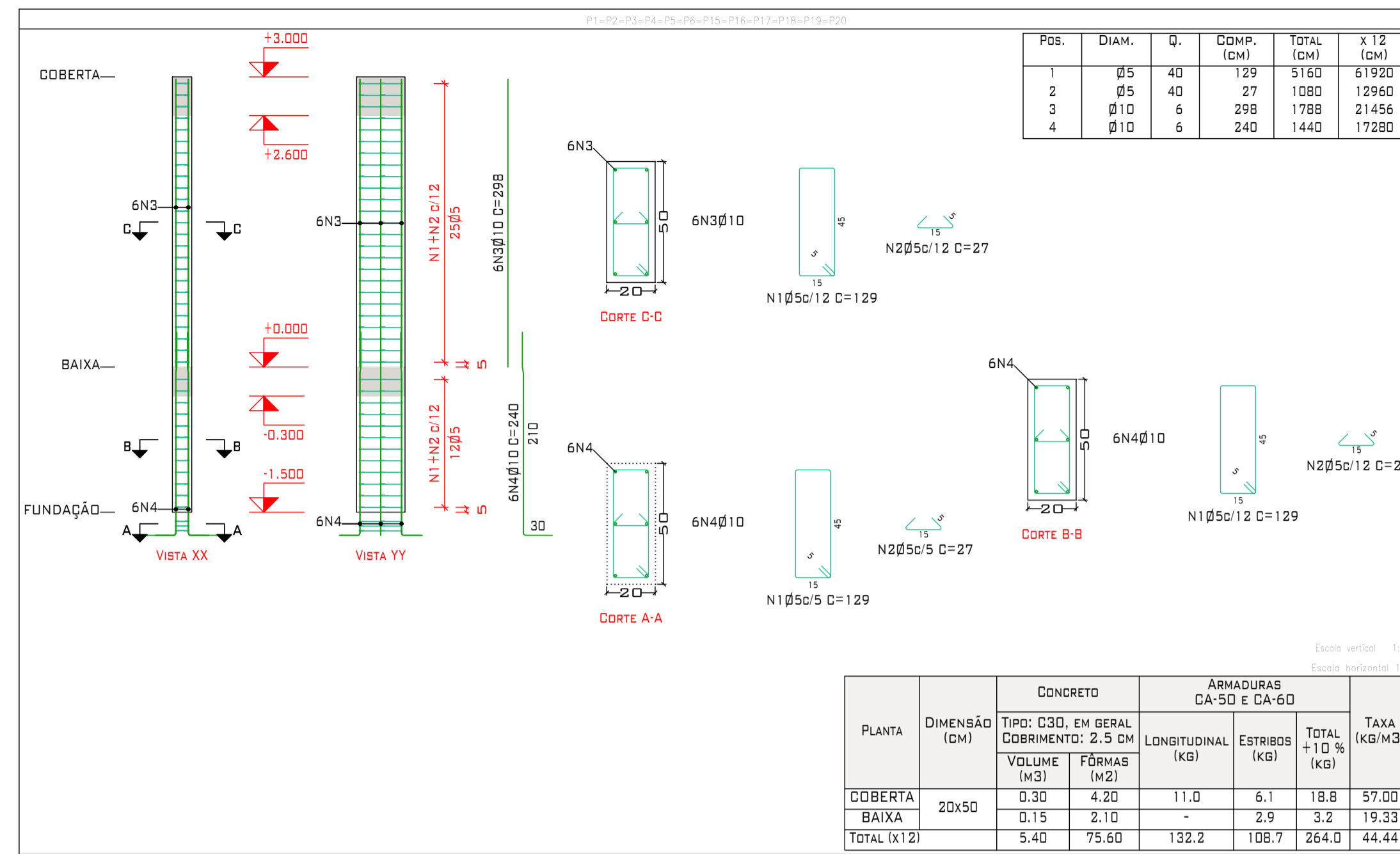
Área: \_\_\_\_\_  
 Obra: APAE - CAMPINA GRANDE  
 Local: EUTICIA VITAL RIBEIRO, CATOLE

Assunto: PROJETO ESTRUTURAL  
 Folha: 03/08

Escala: INDICADA  
 Data: \_\_\_\_\_  
 Calculista: CLAUDECI TOME FILHO  
 Estrutural: CREA PB 162040756-6

Proprietário: SPM - Superintendencia de Obras de Desenvolvimento Do estado da Paraíba  
**Estrutural**





ELEMENTO	POS.	DIAM.	Q.	ESQUEMA (CM)	COMP. (CM)	TOTAL (CM)	CA-50 (KG)	CA-60 (KG)
P1=P2=P3=P4=P5 P6=P15=P16=P17 P18=P19=P20	1	Ø5	40		129	5160	8.1	
	2	Ø5	40		27	1080	1.7	
	3	Ø10	6		298	1788		11.0
	4	Ø10	6		240	1440		8.9
TOTAL+10% (X12):							21.9	10.8
							262.8	129.6
P7=P13	1	Ø5	40		79	3160	5.0	
	2	Ø10	4		335	1340	8.3	
	3	Ø10	4		240	960	5.9	
TOTAL+10% (X2):							15.6	5.5
							31.2	11.0
P8=P14	1	Ø5	40		79	3160	5.0	
	2	Ø10	4		298	1192	7.3	
	3	Ø10	4		240	960	5.9	
TOTAL+10% (X2):							14.5	5.5
							29.0	11.0
P9=P10=P11=P12	1	Ø5	62		79	4898	7.7	
	2	Ø10	4		335	1340	8.3	
	3	Ø10	4		275	1100	6.8	
	4	Ø10	4		240	960	5.9	
TOTAL+10% (X4):							23.1	8.5
							92.4	34.0
							Ø5:	0.0
							Ø10:	415.4
							TOTAL:	415.4

RESUMO AÇO PILARES	COMP. TOTAL (M)	PESO+10% (KG)	TOTAL
CA-50 Ø10	612.4	415	415
CA-60 Ø5	1071.1	185	185
TOTAL		600	600

Pilares que nascem em FUNDAÇÃO e chegam em TAMPA CAIXA D'ÁGUA  
 Concreto: C30, em geral  
 Aço das barras: CA-50 e CA-60  
 Aço dos estribos: CA-50 e CA-60

**COBRIMENTOS MÍNIMOS**  
 LAJE E ESCADA: 2,5cm  
 PILAR: 2,5cm  
 PILAR (CONTATO COM O SOLO): 2,5cm  
 SAPATA: 4cm  
 VIGA: 2,5cm

**CONCRETO**  
 fck = 25 MPa  
 AÇO: CA-50 E CA-60



IDENTIFICAÇÃO			
CL	PJ	VR	CT
MA	ES	00	01

Responsável Técnico: \_\_\_\_\_

Área: \_\_\_\_\_

Assunto: PROJETO ESTRUTURAL

Escala: INDICADA

Proprietário: APAE

Obra: APAE - CAMPINA GRANDE

Local: EUTICIA VITAL RIBEIRO, CATOLE

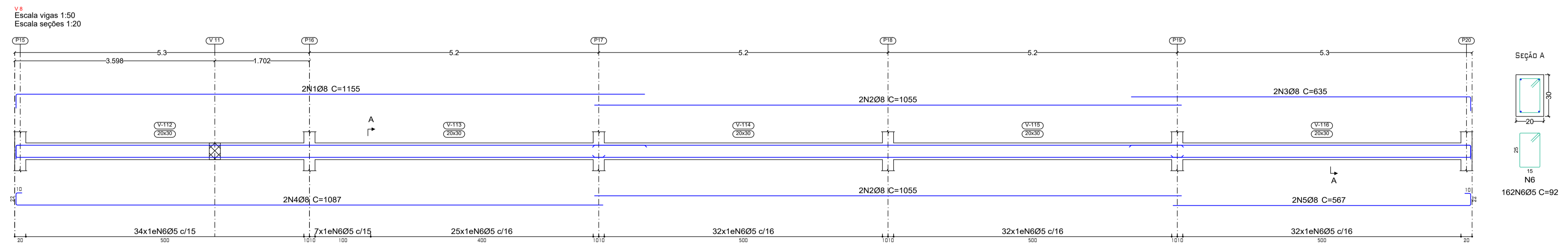
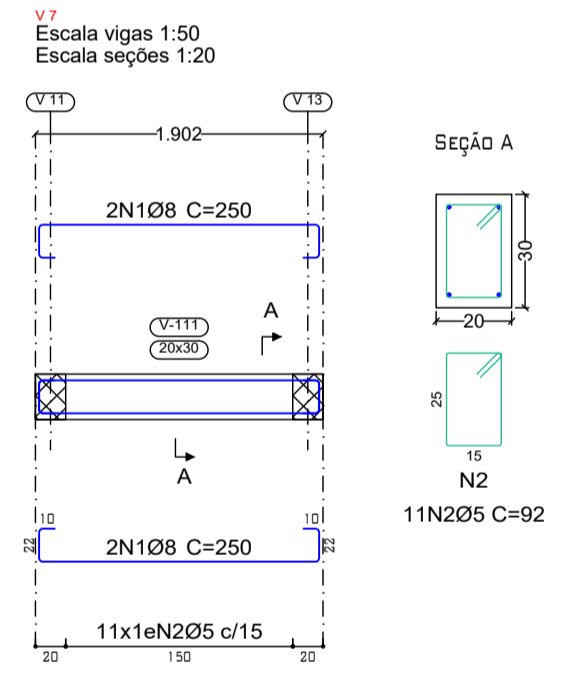
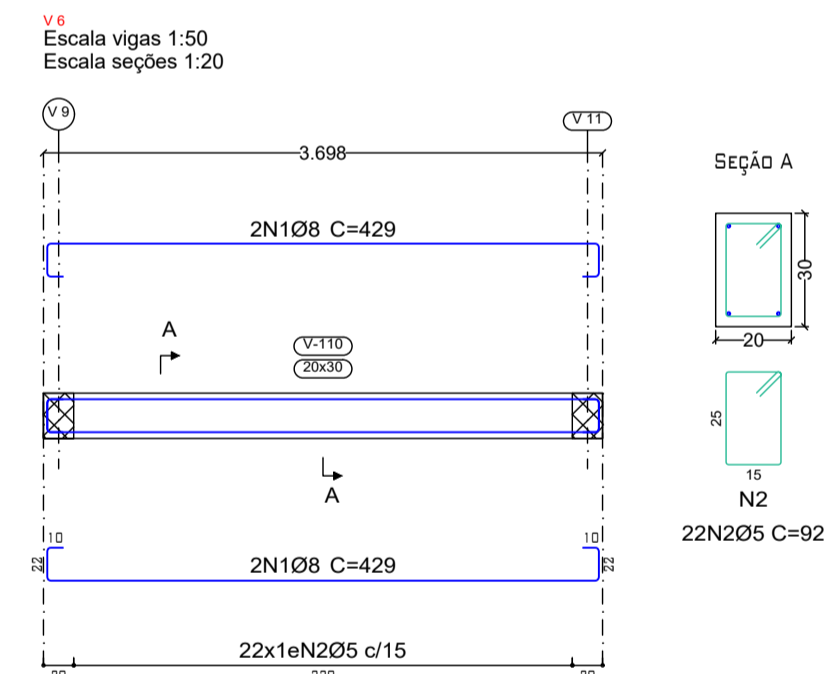
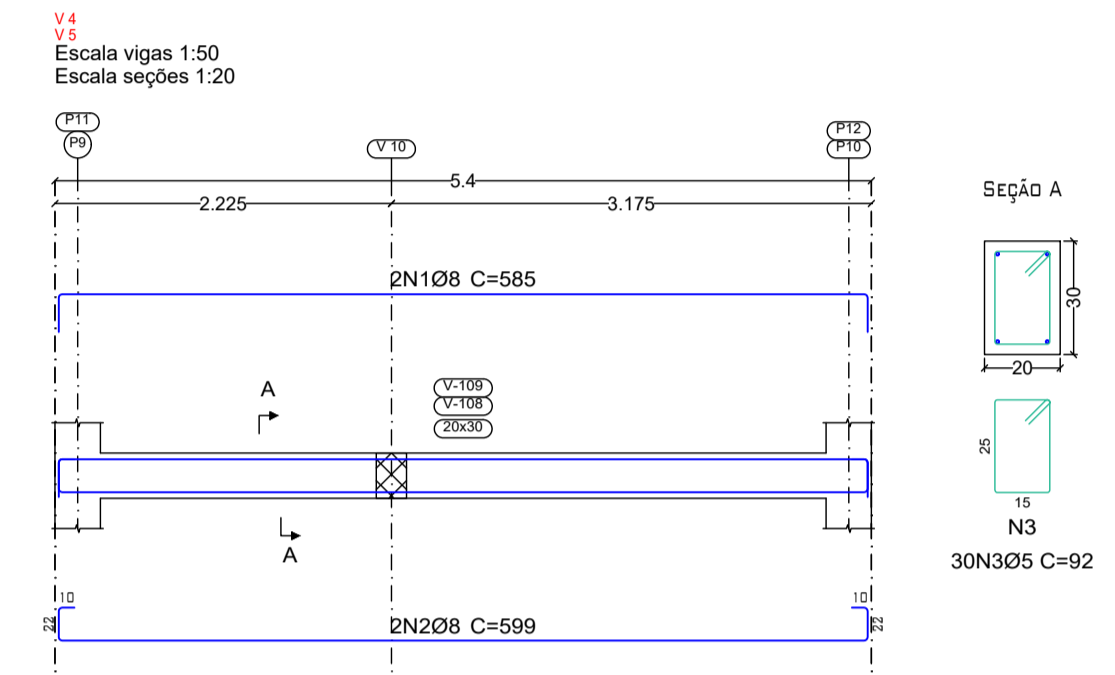
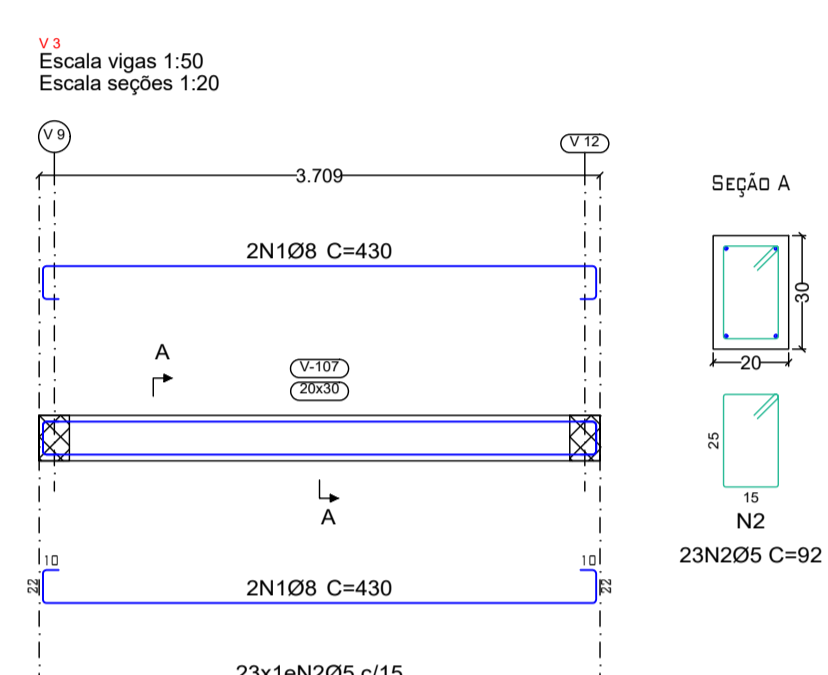
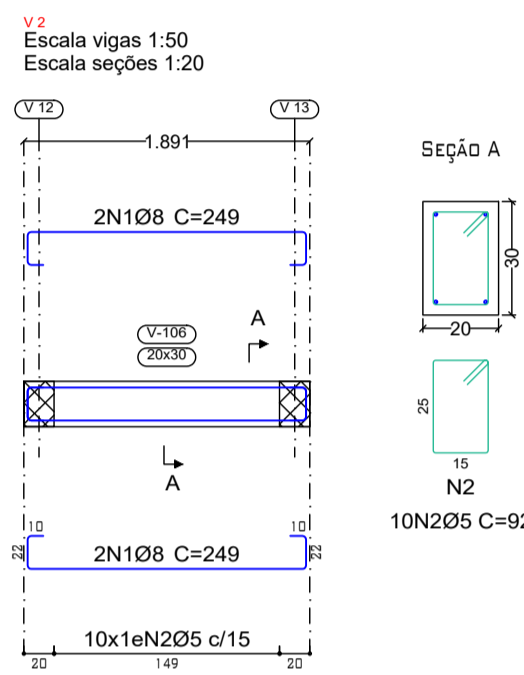
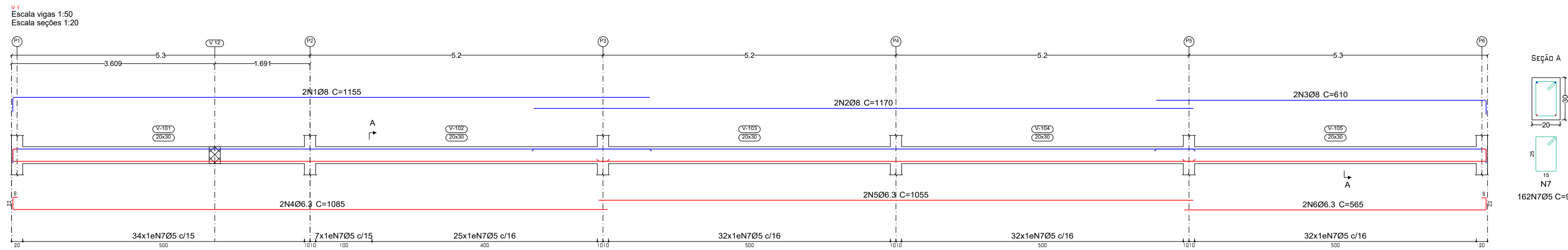
Folha: 04/08

Data: \_\_\_\_\_

Calculista: CLAUDECI TOMÉ FILHO  
 Estrutural: CREA-PB 162040756-6

**Estrutural**





ELEMENTO	POS.	DIAM.	Q.	ESQUEMA (CM)	COMP. (CM)	TOTAL (CM)	CA-50 (KG)	CA-60 (KG)
V 1	1	Ø8	2	1130	1155	2310	9.1	
	2	Ø8	2	1170	1170	2340	9.2	
	3	Ø8	2	585	610	1220	4.8	
	4	Ø6.3	2	1055	1085	2170	5.3	
	5	Ø6.3	2	1055	1055	2110	5.2	
	6	Ø6.3	2	535	565	1130	2.8	
	7	Ø5	162		93	15066		23.7
TOTAL+1DR:							40.0	26.1
V 2	1	Ø8	4	249	249	996	3.9	
	2	Ø5	10	93	930		1.5	
TOTAL+1DR:							4.3	1.7
V 3	1	Ø8	4	430	430	1720	6.8	
	2	Ø5	23	93	2139		3.4	
TOTAL+1DR:							7.5	3.7
V 4=V 5	1	Ø8	2	585	585	1170	4.6	
	2	Ø8	2	599	599	1198	4.7	
	3	Ø5	30	93	2790		4.4	
TOTAL+1DR:							10.2	4.8
TOTAL+1DR:							20.4	9.6
V 6	1	Ø8	4	429	429	1716	6.8	
	2	Ø5	22	93	2046		3.2	
TOTAL+1DR:							7.5	3.5
V 7	1	Ø8	4	250	250	1000	3.9	
	2	Ø5	11	93	1023		1.6	
TOTAL+1DR:							4.3	1.8
V 8	1	Ø8	2	1130	1155	2310	9.1	
	2	Ø8	4	1055	1055	4220	16.7	
	3	Ø8	2	610	635	1270	5.0	
	4	Ø8	2	1055	1087	2174	8.6	
	5	Ø8	2	535	567	1134	4.5	
	6	Ø5	162	93	15066		23.7	
TOTAL+1DR:							48.3	26.1
Ø5:							0.0	72.5
Ø6.3:							14.6	0.0
Ø8:							117.7	0.0
TOTAL:							132.3	72.5

BAIXA  
 Desenho de vigas  
 Concreto: C30, em geral  
 Aço das barras: CA-50 e CA-60  
 Aço dos estribos: CA-50 e CA-60  
 Escala vigas 1:50  
 Escala seções 1:20  
 Escala aberturas 1:20

**COBRIMENTOS MÍNIMOS**  
 LAJE E ESCADA: 2,5cm  
 PILAR: 2,5cm  
 PILAR (CONTATO COM O SOLO): 2,5cm  
 SAPATA: 4cm  
 VIGA: 2,5cm

**CONCRETO**  
 fck = **25** MPa  
 AÇO: CA-50 E CA-60

**PROJETO ESTRUTURAL**



IDENTIFICAÇÃO			
CL	PJ	VR	CT
MA	ES	00	01

Responsável Técnico: \_\_\_\_\_

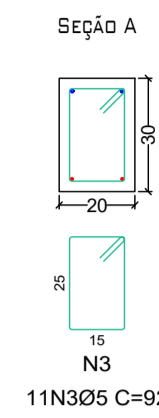
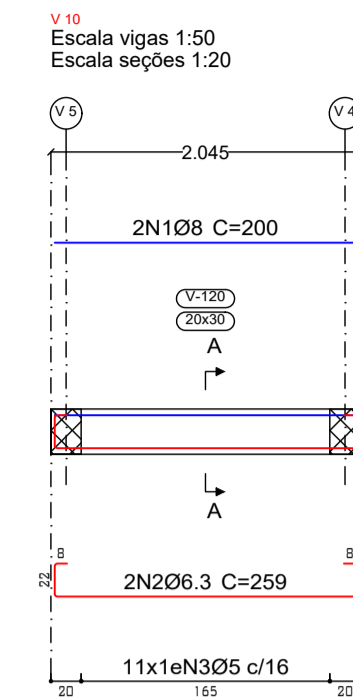
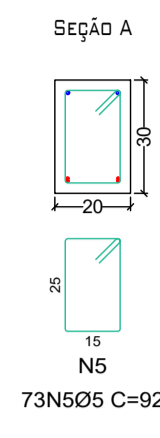
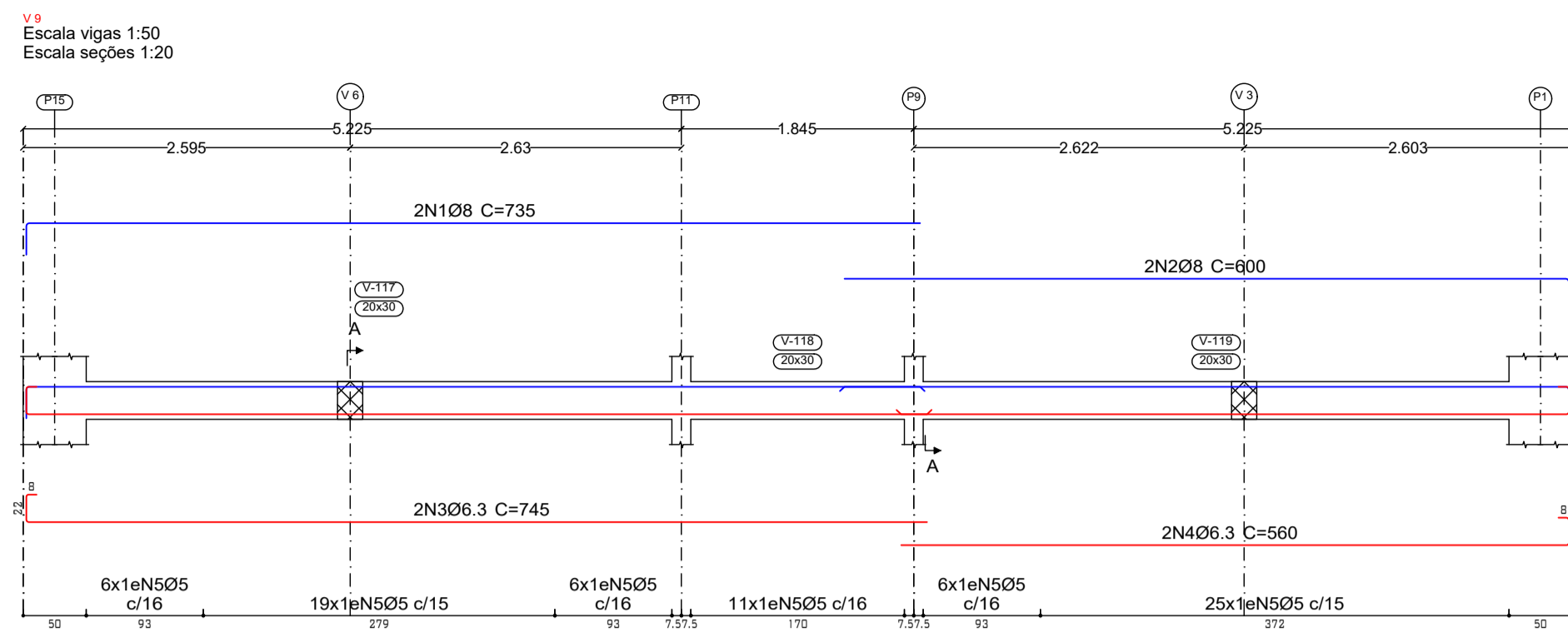
Área: \_\_\_\_\_  
 Obra: **APAE - CAMPINA GRANDE**  
 Local: **EUTICIA VITAL RIBEIRO, CATOLE**

Assunto: **PROJETO ESTRUTURAL**  
 Folha: **05/08**

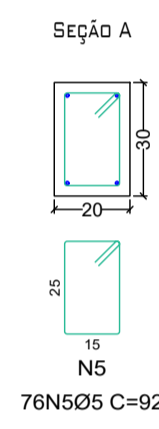
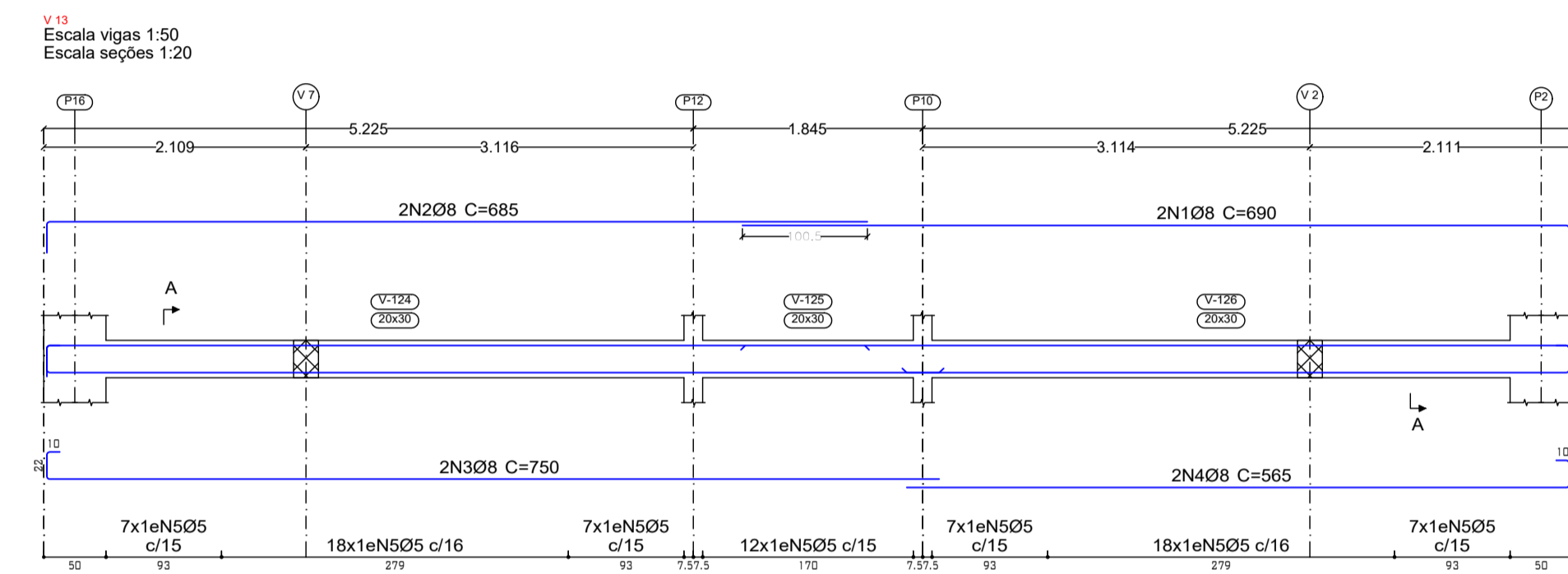
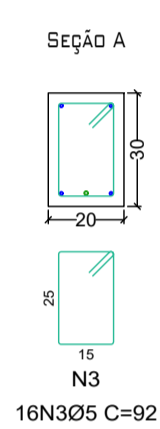
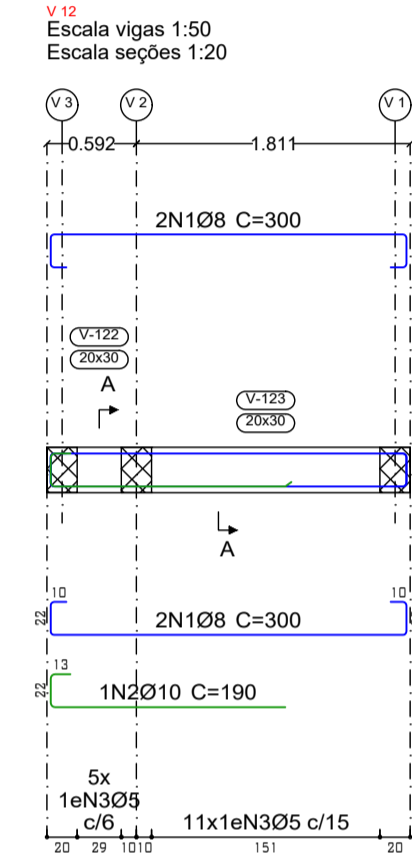
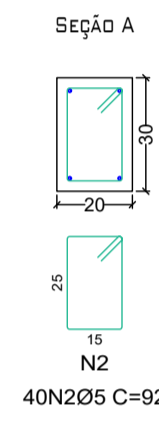
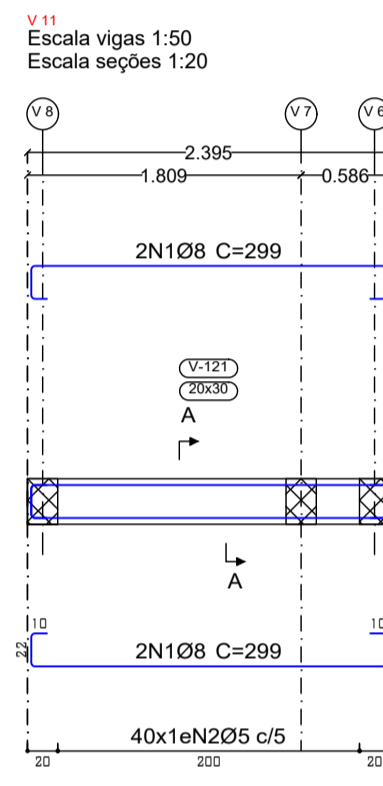
Escala: **INDICADA**  
 Data: \_\_\_\_\_  
 Proprietário: **APAE**

Calculista: **CLAUDECI TOMÉ FILHO**  
 Estrutural: **CREA-PB 162040756-6**

**Estrutural**



BAIXA  
Desenho de vigas  
Concreto: C30, em geral  
Aço das barras: CA-50 e CA-60  
Escala vigas 1:50  
Escala seções 1:20  
Escala aberturas 1:20



ELEMENTO	POS.	DIAM.	Q.	ESQUEMA (CM)	COMP. (CM)	TOTAL (CM)	CA-50 (KG)	CA-60 (KG)	
V 15	1	Ø8	2	815	840	1680	6.6		
	2	Ø8	2	490	510	1020	4.0		
	3	Ø8	2	815	847	1694	6.7		
	4	Ø8	2	435	467	934	3.7		
	5	Ø5	68		93	6324		9.9	
TOTAL+10%:							23.1	10.9	
V 13	1	Ø8	2	665	690	1380	5.4		
	2	Ø8	2	660	685	1370	5.4		
	3	Ø8	2	718	750	1500	5.9		
	4	Ø8	2	533	565	1130	4.5		
	5	Ø5	76		93	7068		11.1	
TOTAL+10%:							23.3	12.2	
V 14	1	Ø8	2	405	455	910	3.6		
	2	Ø8	2	405	469	938	3.7		
	3	Ø5	22		83	1826		2.9	
TOTAL+10%:							8.0	3.2	
V 12	1	Ø8	4	288	300	1200	4.7		
	2	Ø10	1	190	190	190	1.2		
	3	Ø5	16		93	1488		2.3	
TOTAL+10%:							6.5	2.5	
V 11	1	Ø8	4	288	299	1196	4.7		
	2	Ø5	40		93	3720		5.8	
TOTAL+10%:							5.2	6.4	
V 10	1	Ø8	2	200	200	400	1.6		
	2	Ø6.3	2	259	259	518	1.3		
	3	Ø5	11		93	1023		1.6	
TOTAL+10%:							3.2	1.8	
V 9	1	Ø8	2	710	735	1470	5.8		
	2	Ø8	2	575	600	1200	4.7		
	3	Ø6.3	2	715	745	1490	3.6		
	4	Ø6.3	2	590	560	1120	2.7		
	5	Ø5	73		93	6789		10.7	
TOTAL+10%:							18.5	11.8	
							Ø5:	0.0	48.8
							Ø6.3:	8.3	0.0
							Ø8:	78.2	0.0
							Ø10:	1.3	0.0
							TOTAL:	87.8	48.8

RESUMO AÇO DESENHO DE VIGAS	COMP. TOTAL (M)	PESO+10% (KG)	TOTAL
DA-50 Ø6.3	85.4	23	
Ø8	451.7	196	
Ø10	1.9	1	220
DA-60 Ø5	700.9	121	121
TOTAL			341

**COBRIMENTOS MÍNIMOS**

LAJE E ESCADA: 2,5cm  
PILAR: 2,5cm  
PILAR (CONTATO COM O SOLO): 2,5cm  
SAPATA: 4cm  
VIGA: 2,5cm

**CONCRETO**  
fck = **25** MPa  
AÇO: CA-50 E CA-60

**PROJETO ESTRUTURAL**



IDENTIFICAÇÃO			
CL	PJ	VR	CT
MA	ES	00	01

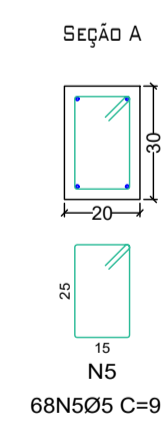
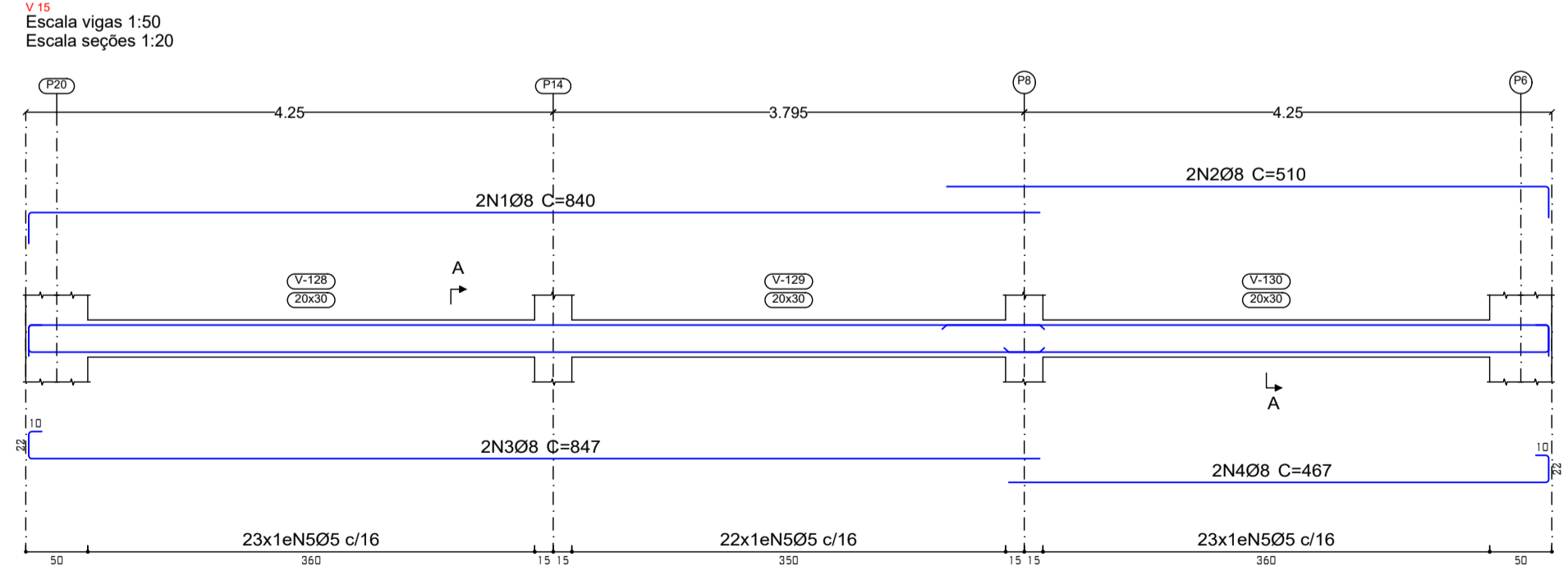
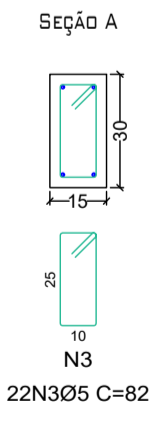
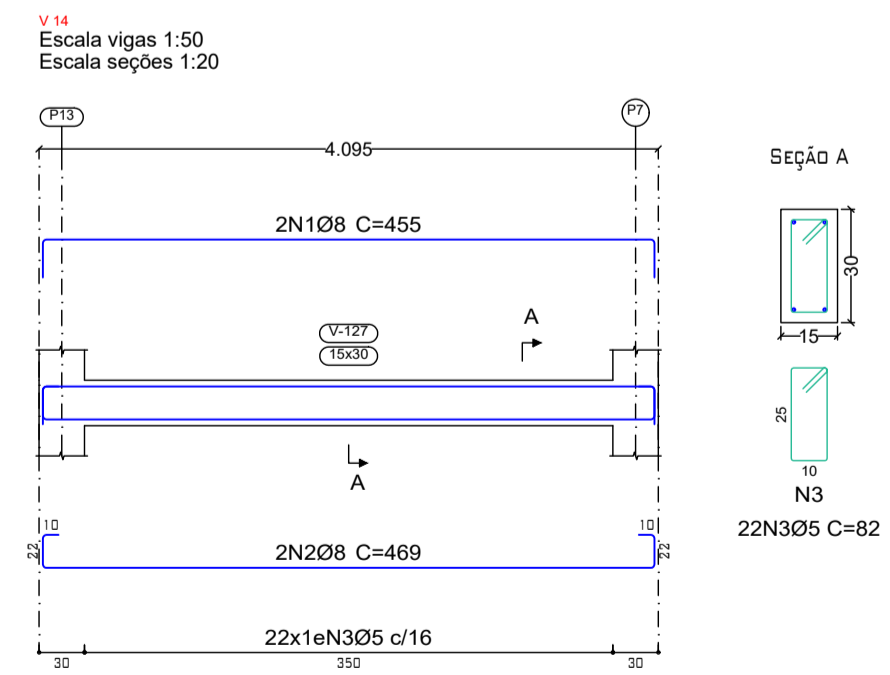
Responsável Técnico: **GERALDO BENEVIDES DE PAIVA FILHO**

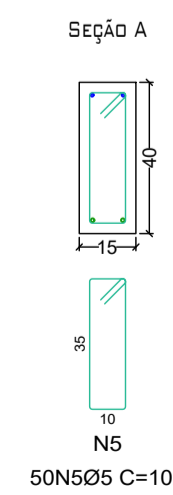
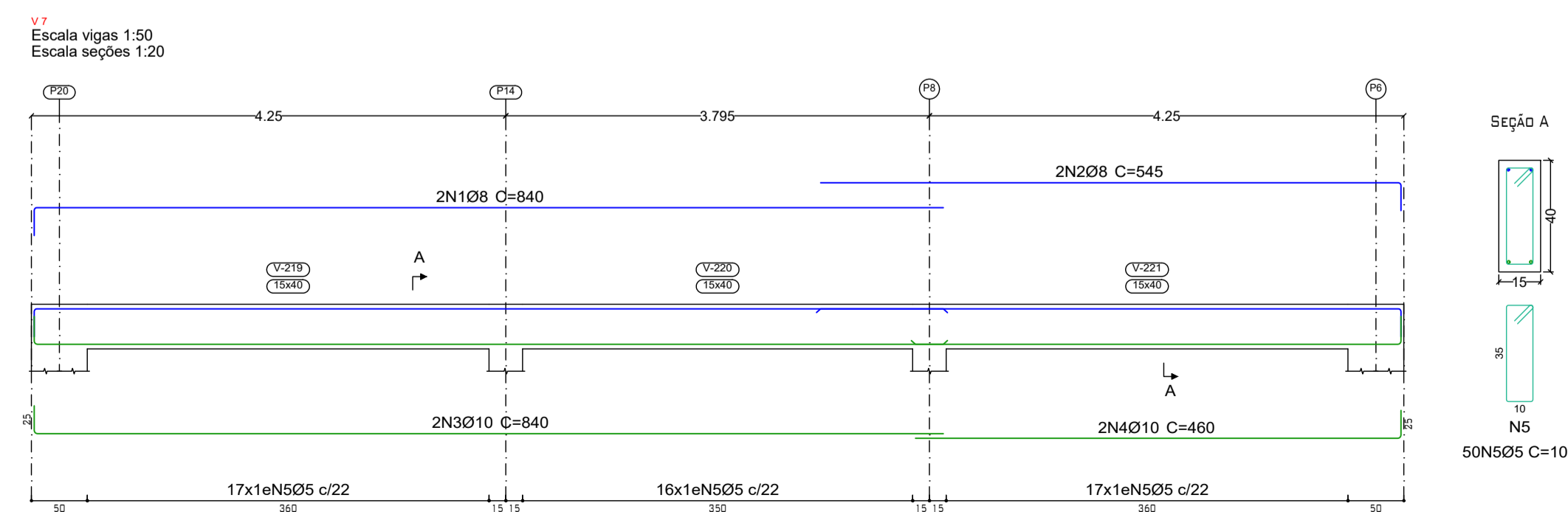
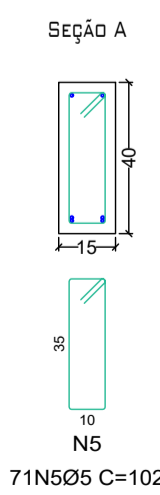
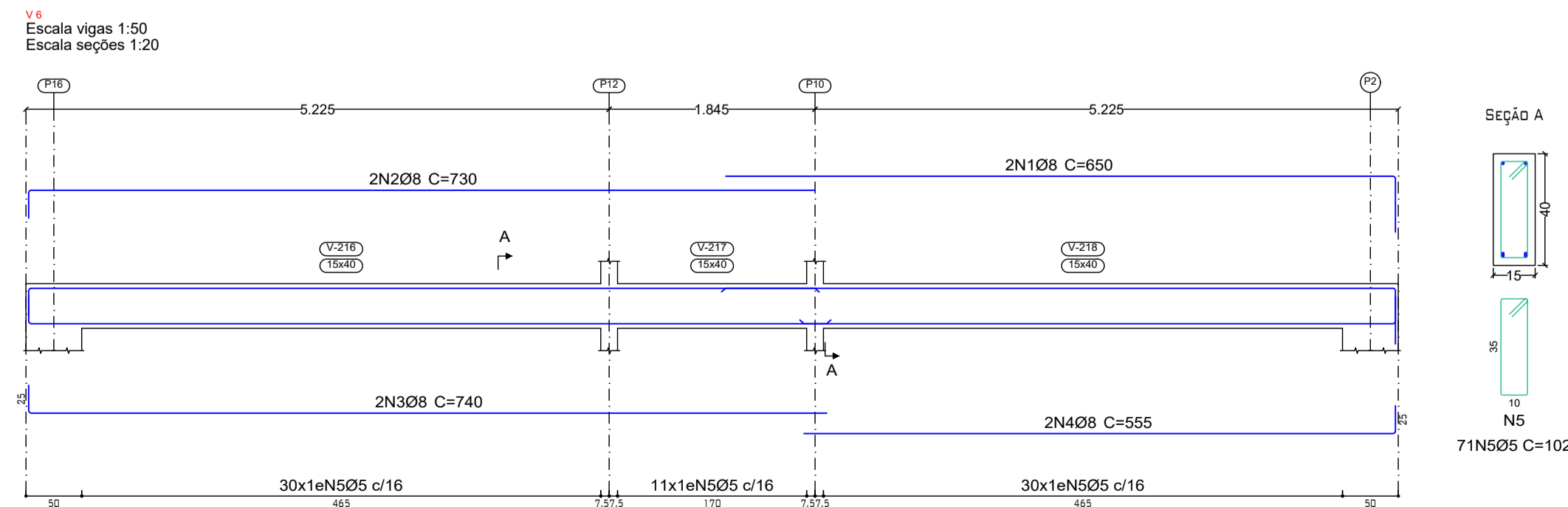
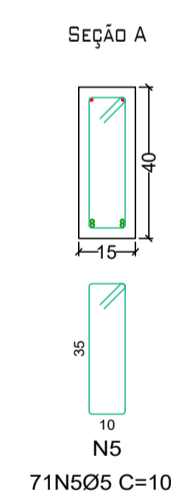
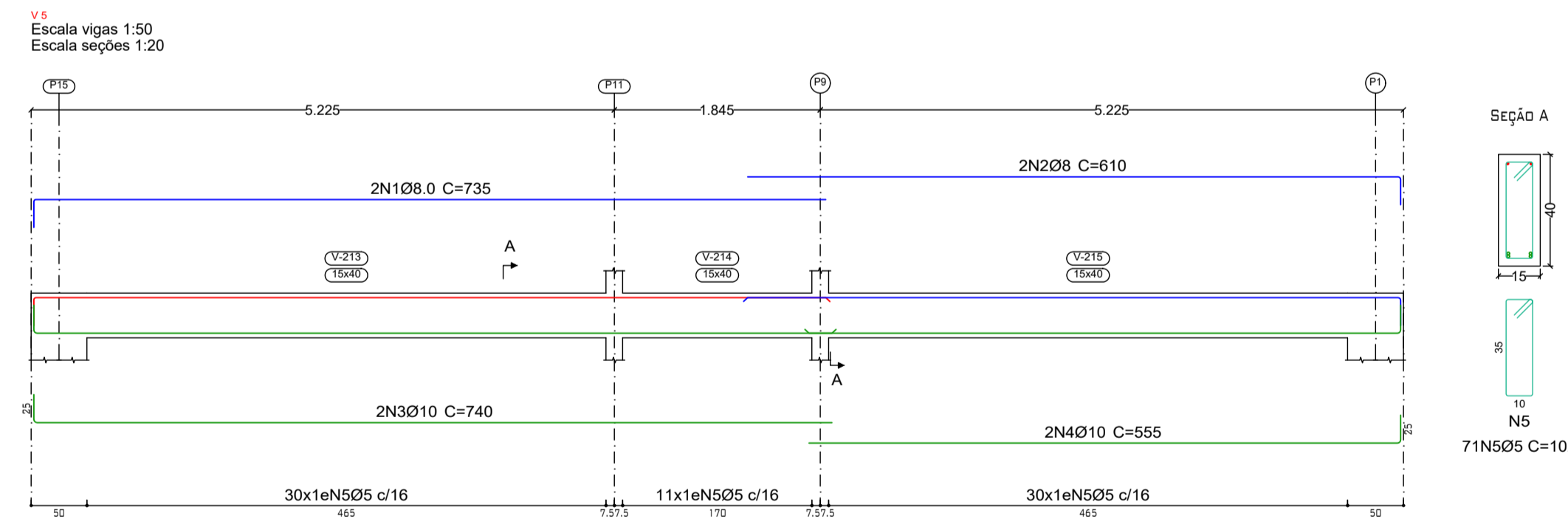
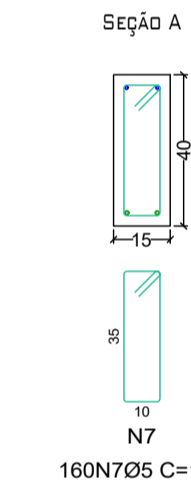
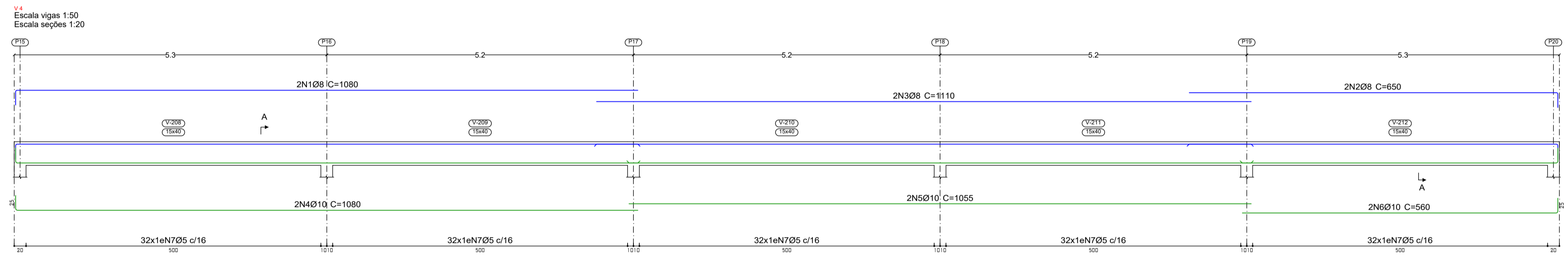
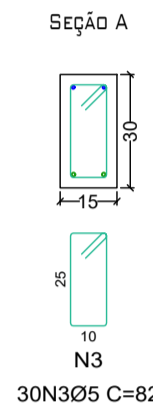
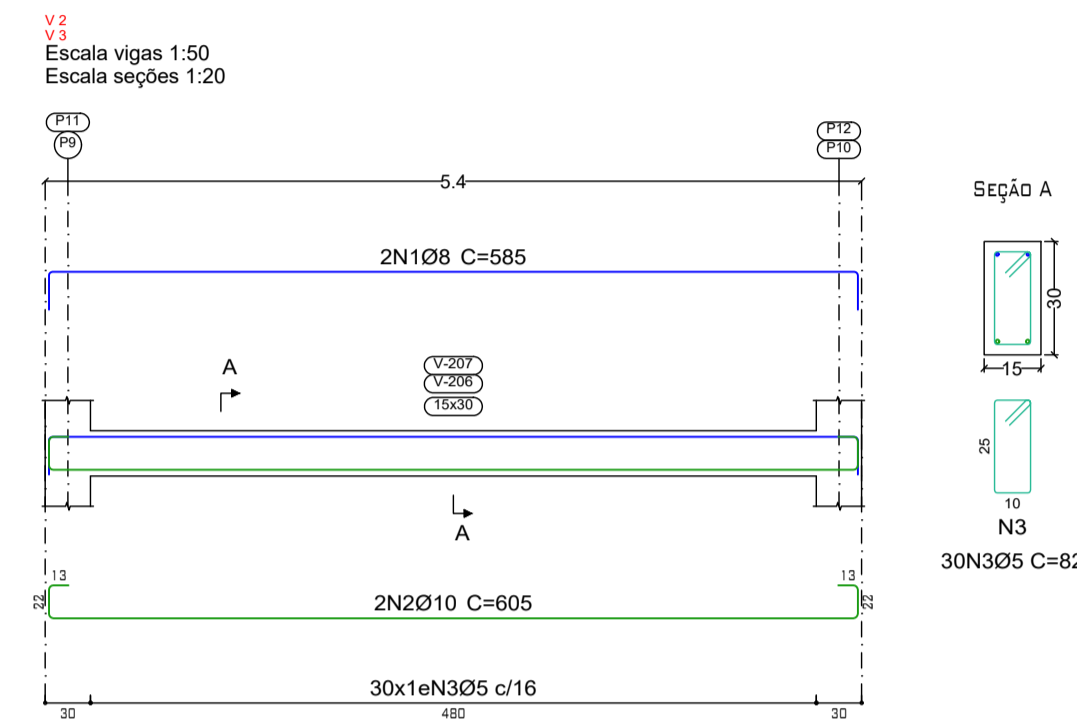
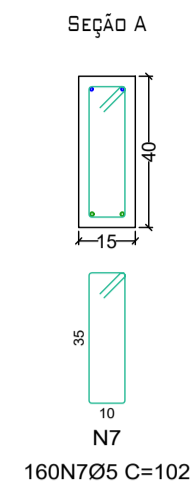
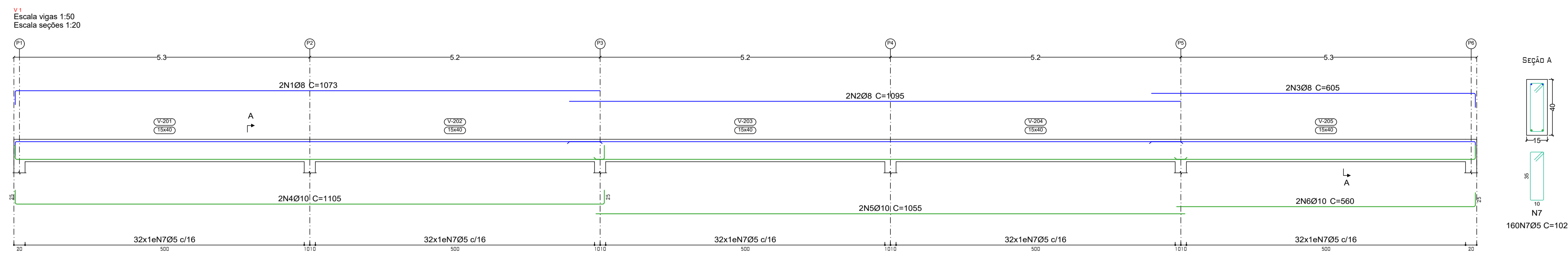
Área: **APAE - CAMPINA GRANDE**  
Local: **EUTICIA VITAL RIBEIRO, CATOLE**

Assunto: **PROJETO ESTRUTURAL** Folha: **06/08**

Escala: **INDICADA** Data:  Calculista: **CLAUDECI TOMÉ FILHO**  
Estrutural: **CREA-PB 162040756-6**

Proprietário: **APAE** **Estrutural**





ELEMENTO	POS.	DIAM.	Q.	ESQUEMA (CM)	COMP. (CM)	TOTAL (CM)	CA-50 (KG)	CA-60 (KG)
V 1	1	Ø8	2	1088	1073	2146	8.5	
	2	Ø8	2	1095	1095	2190	8.6	
	3	Ø8	2	580	605	1210	4.8	
	4	Ø10	2	1095	1105	2210	13.6	
	5	Ø10	2	1055	1055	2110	13.0	
	6	Ø10	2	535	560	1120	6.9	
	7	Ø5	160		103	16480		25.9
TOTAL+10%							60.9	28.5
V 2-V 3	1	Ø8	2	535	585	1170	4.6	
	2	Ø10	2	535	605	1210	7.5	
	3	Ø5	30		83	2490		3.9
TOTAL+10% (x2)							13.3	4.3
							26.6	8.6
V 4	1	Ø8	2	1055	1080	2160	8.5	
	2	Ø8	2	625	650	1300	5.1	
	3	Ø8	2	1110	1110	2220	8.8	
	4	Ø10	2	1055	1080	2160	13.3	
	5	Ø10	2	1055	1055	2110	13.0	
	6	Ø10	2	535	560	1120	6.9	
	7	Ø5	160		103	16480		25.9
TOTAL+10%							61.2	28.5
V 5	1	Ø8	2	710	735	1470	3.6	
	2	Ø8	2	585	610	1220	4.8	
	3	Ø10	2	715	740	1480	9.1	
	4	Ø10	2	530	555	1110	6.8	
	5	Ø5	71		103	7313		11.5
TOTAL+10%							26.7	12.7
V 6	1	Ø8	2	690	650	1300	5.1	
	2	Ø8	2	705	730	1460	5.8	
	3	Ø8	2	715	740	1480	5.8	
	4	Ø8	2	530	555	1110	4.4	
	5	Ø5	71		103	7313		11.5
TOTAL+10%							23.2	12.7
V 7	1	Ø8	2	815	840	1680	6.6	
	2	Ø8	2	520	545	1090	4.3	
	3	Ø10	2	815	840	1680	10.4	
	4	Ø10	2	435	460	920	5.7	
	5	Ø5	50		103	5150		8.1
TOTAL+10%							29.7	8.9
							0.0	99.9
							0.6	4.0
							0.0	0.0
							99.3	0.0
							0.0	0.0
							125.0	0.0
							228.3	99.9

RESUMO AÇO DESENHO DE VIGAS	COMP. (M)	PESO+10% (KG)	TOTAL
CA-50 Ø6.3	14.7	4	
Ø8	229.1	99	228
Ø10	184.4	125	100
CA-60 Ø5	577.2	100	328
TOTAL			

### COBRIMENTOS MÍNIMOS

LAJE E ESCADA: 2,5cm  
 PILAR: 2,5cm  
 PILAR (CONTATO COM O SOLO): 2,5cm

SAPATA: 4cm  
 VIGA: 2,5cm

CONCRETO  
 fck = 25 MPa

AÇO: CA-50 E CA-60

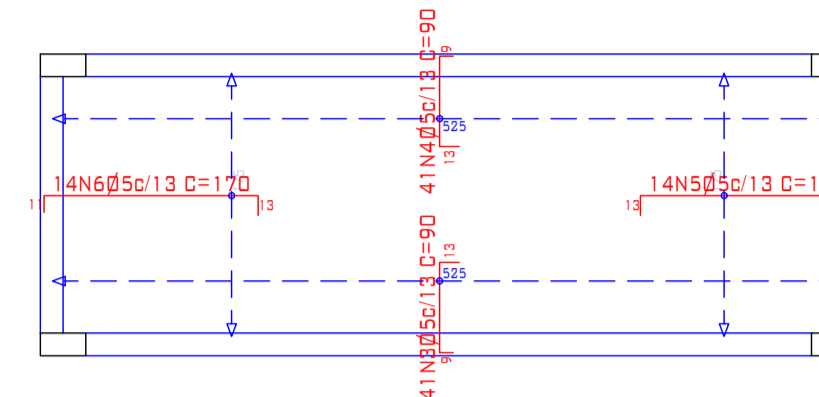
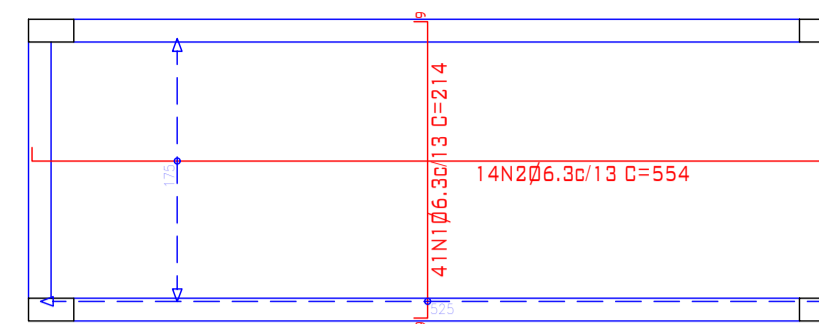
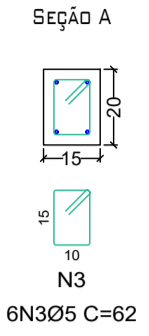
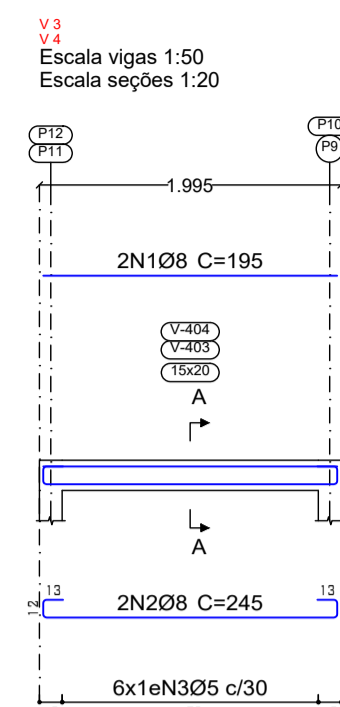
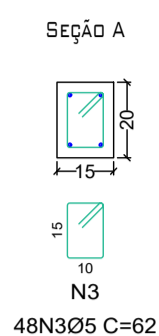
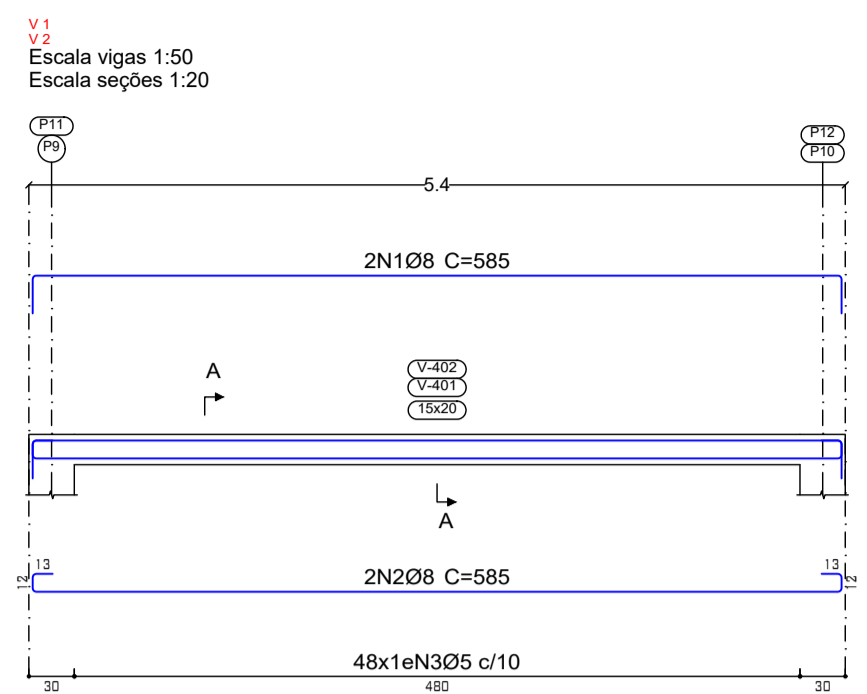
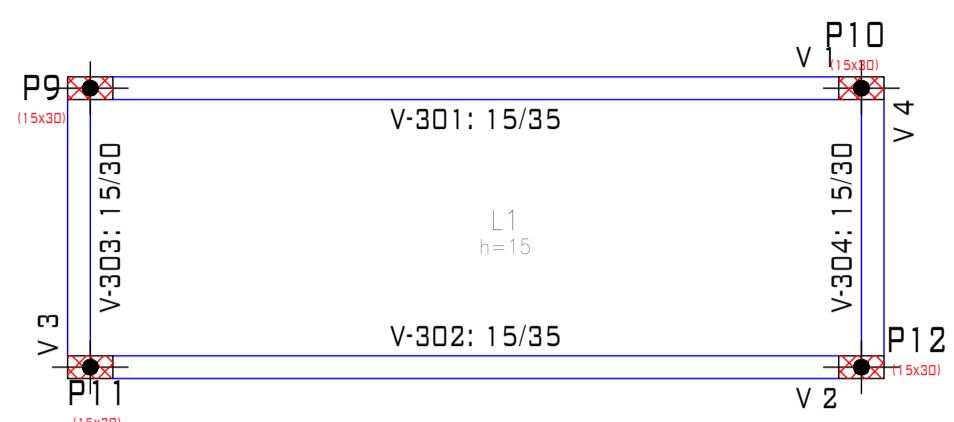
### PROJETO ESTRUTURAL



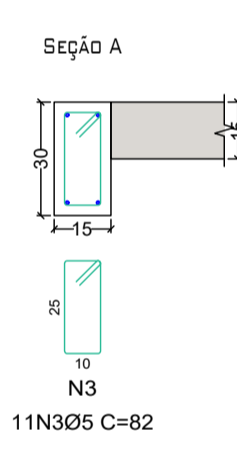
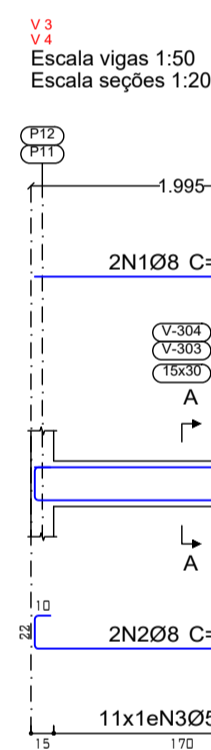
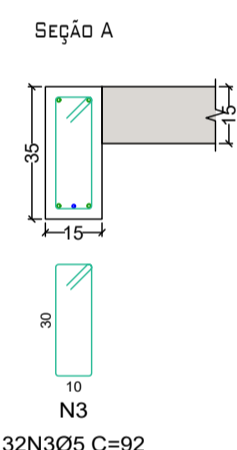
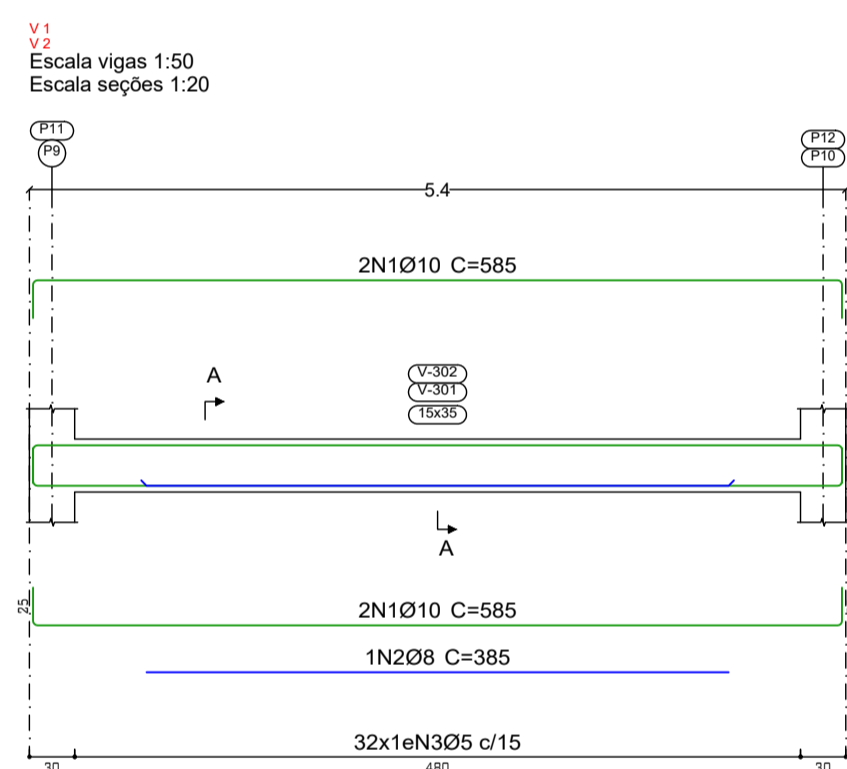
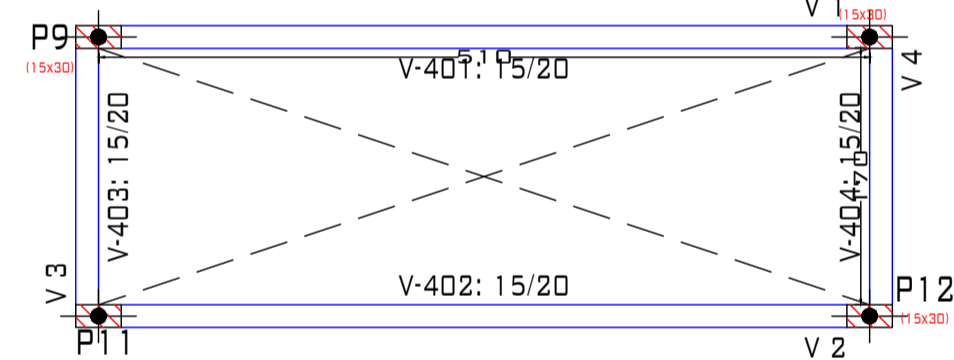
IDENTIFICAÇÃO			
CL	PJ	VR	CT
MA	ES	00	01

Responsável Técnico		_____	
Área:	Obra: APAE - CAMPINA GRANDE		
	Local: EUTICIA VITAL RIBEIRO, CATOLE		
Assunto: PROJETO ESTRUTURAL	Folha: 07/08		
Escala: INDICADA	Data:	Calculista: CLAUDECI TOMÉ FILHO Estrutural: CREA-PB 162040756-6	
Proprietário: APAE	<b>Estrutural</b>		

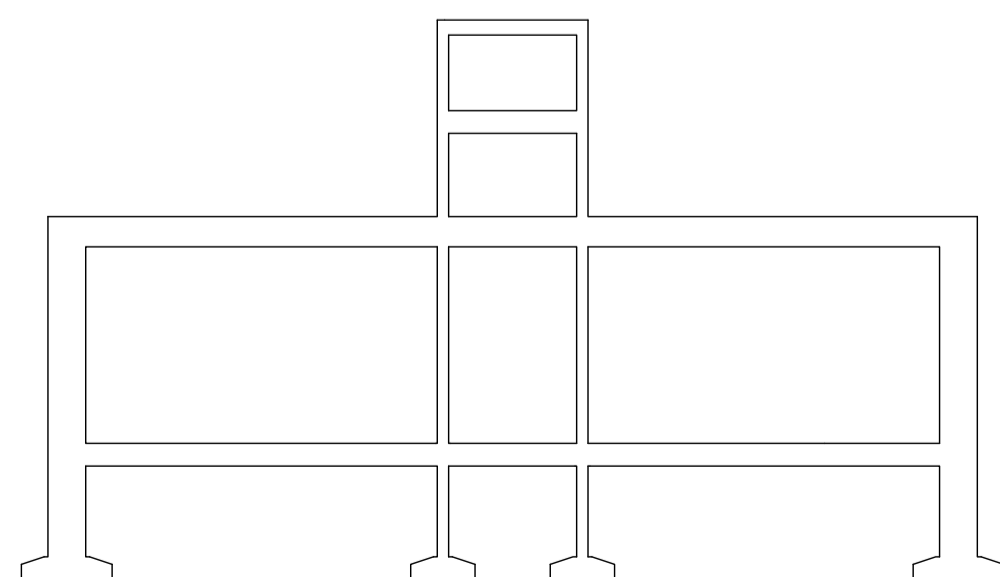




PISO CAIXA D'ÁGUA				
ELEMENTO	FÓRMA (M2)	SUPERFÍCIE (M2)	VOLUME (M3)	BARBAS (KG)
LAJES MACIÇAS	-	8,54	1,300	66
VIGAS	6,81	1,95	0,750	56
PILARES	3,80	-	0,190	37
TOTAL	-	10,59	2,240	159
INDICES (POR M2)	-	-	0,208	14,75
SUPERFÍCIE TOTAL: 10,77 M2				



TAMPA CAIXA D'ÁGUA				
ELEMENTO	FÓRMA (M2)	SUPERFÍCIE (M2)	VOLUME (M3)	BARBAS (KG)
VIGAS	5,20	1,95	0,440	40
PILARES	3,60	-	0,180	5
TOTAL	-	1,95	0,620	45
INDICES (POR M2)	-	-	0,291	21,13
SUPERFÍCIE TOTAL: 2,13 M2				



ELEMENTO	POS.	DIAM.	Q.	ESQUEMA (CM)	COMP. (CM)	TOTAL (CM)	CA-50 (KG)	CA-60 (KG)
V 1=V 2	1	Ø8	2		585	1170	4,6	
	2	Ø8	2		585	1170	4,6	
	3	Ø5	48					4,7
TOTAL+10% (k2):							10,1	5,2
V 3=V 4	1	Ø8	2		195	390	1,5	
	2	Ø8	2		245	490	1,9	
	3	Ø5	6					0,6
TOTAL+10% (k2):							3,7	0,7
V 1=V 2	1	Ø10	4		585	2340	14,4	
	2	Ø8	1		385	385	1,5	
	3	Ø5	32					4,7
TOTAL+10% (k2):							17,5	5,2
V 3=V 4	1	Ø8	2		195	390	1,5	
	2	Ø8	2		259	518	2,0	
	3	Ø5	11					1,4
TOTAL+10% (k2):							3,9	1,5
TOTAL:							70,4	25,2

RESUMO AÇO DESENHO DE VIGAS	COMP. TOTAL (M)	PESO+10% (KG)	TOTAL
CA-50 Ø8	25,9	11	43
CA-60 Ø5	46,8	13	13
TOTAL			56

RESUMO AÇO DESENHO DE VIGAS	COMP. TOTAL (M)	PESO+10% (KG)	TOTAL
CA-50 Ø8	64,4	28	28
CA-60 Ø5	68,0	12	12
TOTAL			40

### COBRIMENTOS MÍNIMOS

LAJE E ESCADA: 2,5cm  
 PILAR: 2,5cm  
 PILAR (CONTATO COM O SOLO): 2,5cm

SAPATA: 4cm  
 VIGA: 2,5cm

CONCRETO  
 fck = **25** MPa  
 AÇO: CA-50 E CA-60

### PROJETO ESTRUTURAL



IDENTIFICAÇÃO			
CL	PJ	VR	CT
MA	ES	00	01

Responsável Técnico			
Área:	Obra: APAE - CAMPINA GRANDE		
	Local: EUTICIA VITAL RIBEIRO, CATOLE		
Assunto: PROJETO ESTRUTURAL		Folha: 08/08	
Escala: INDICADA	Data:	Calculista: CLAUDECI TOMÉ FILHO Estrutural: CREA-PB 162040756-6	
Proprietário: APAE		<b>Estrutural</b>	