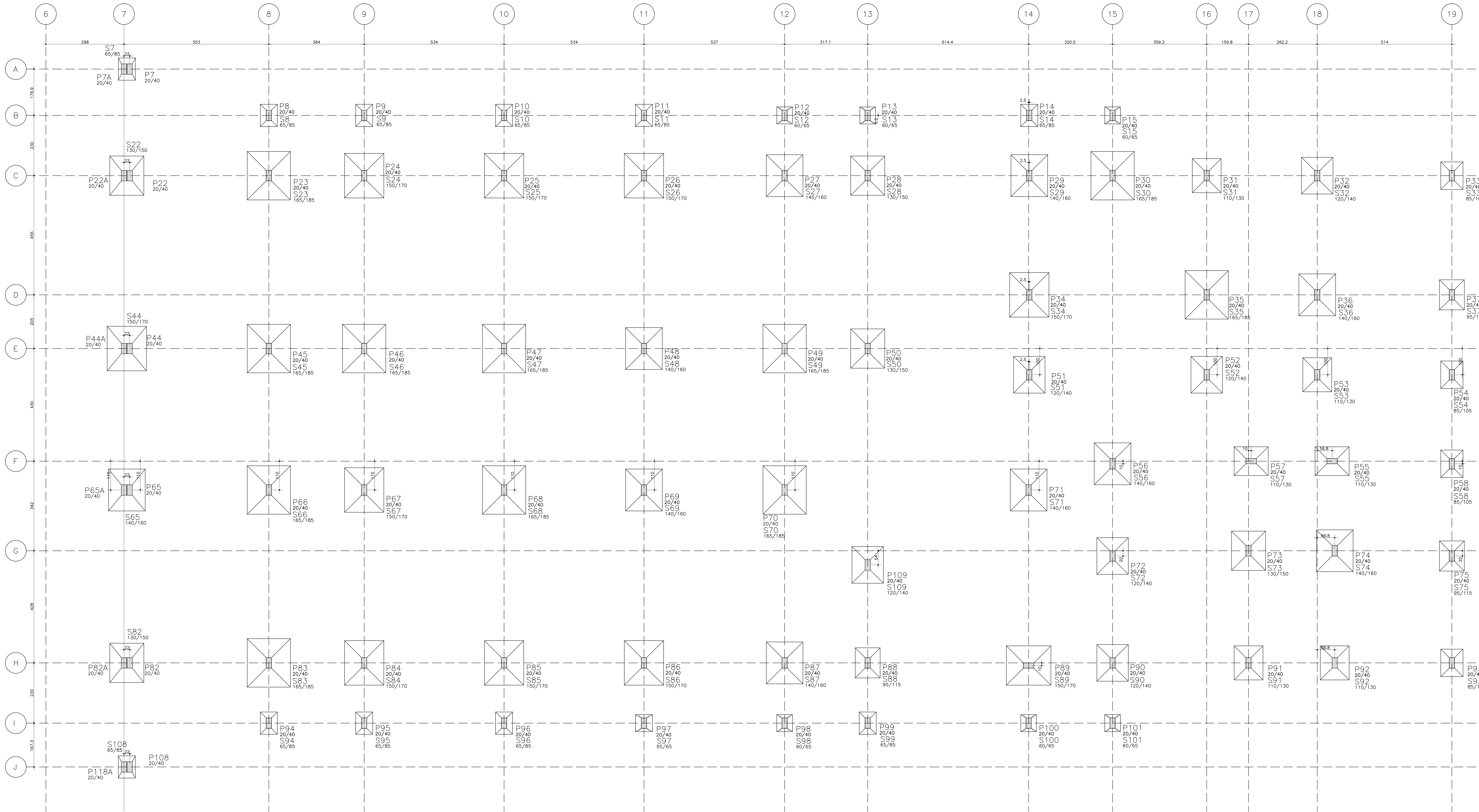




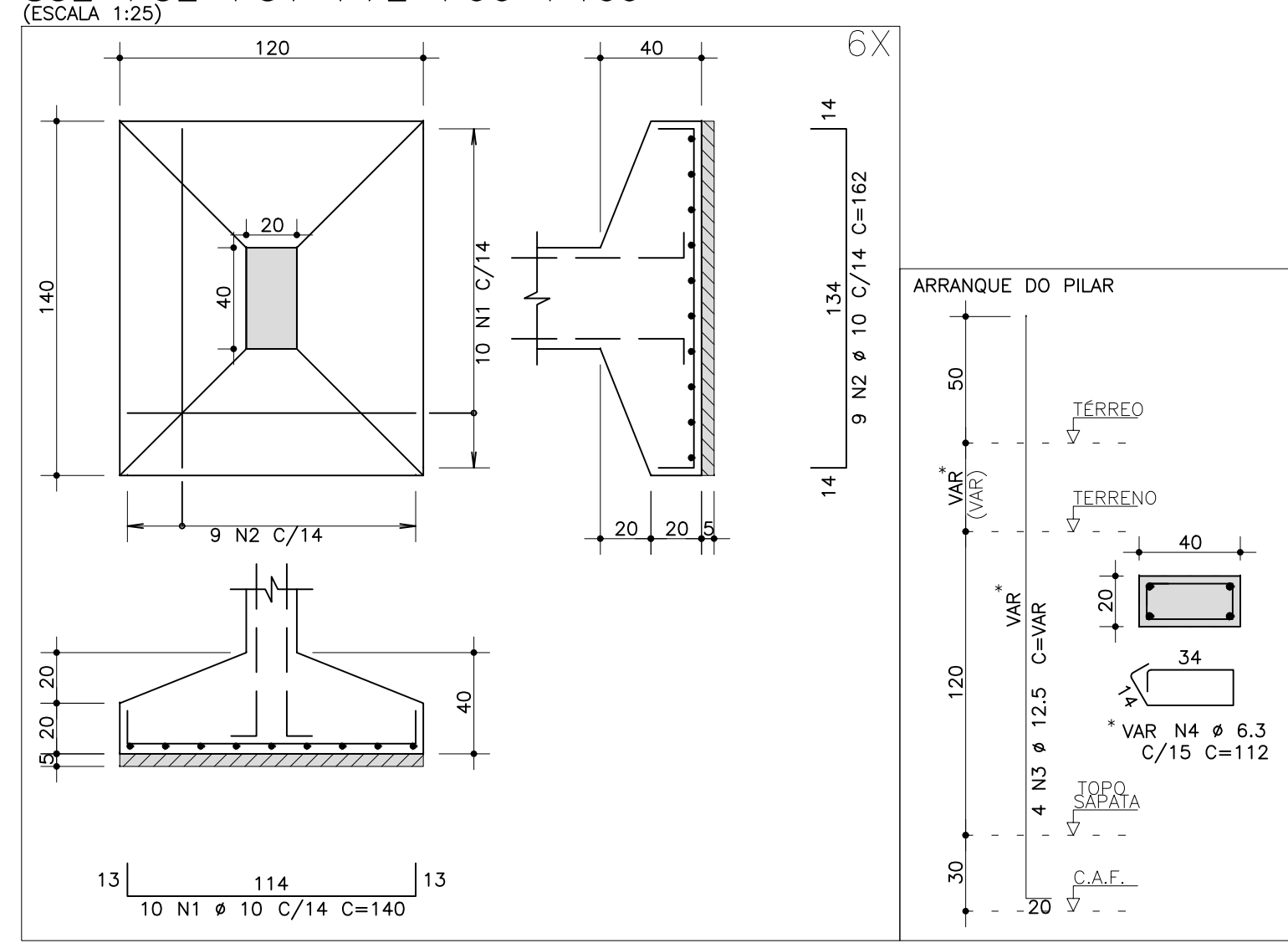
PLANTA DE LOCAÇÃO DOS PILARES – ETAPA 01
(ESCALA 1:50)

THIAGO
EUGENIO DE
MELO
DIAS:0636413
9698

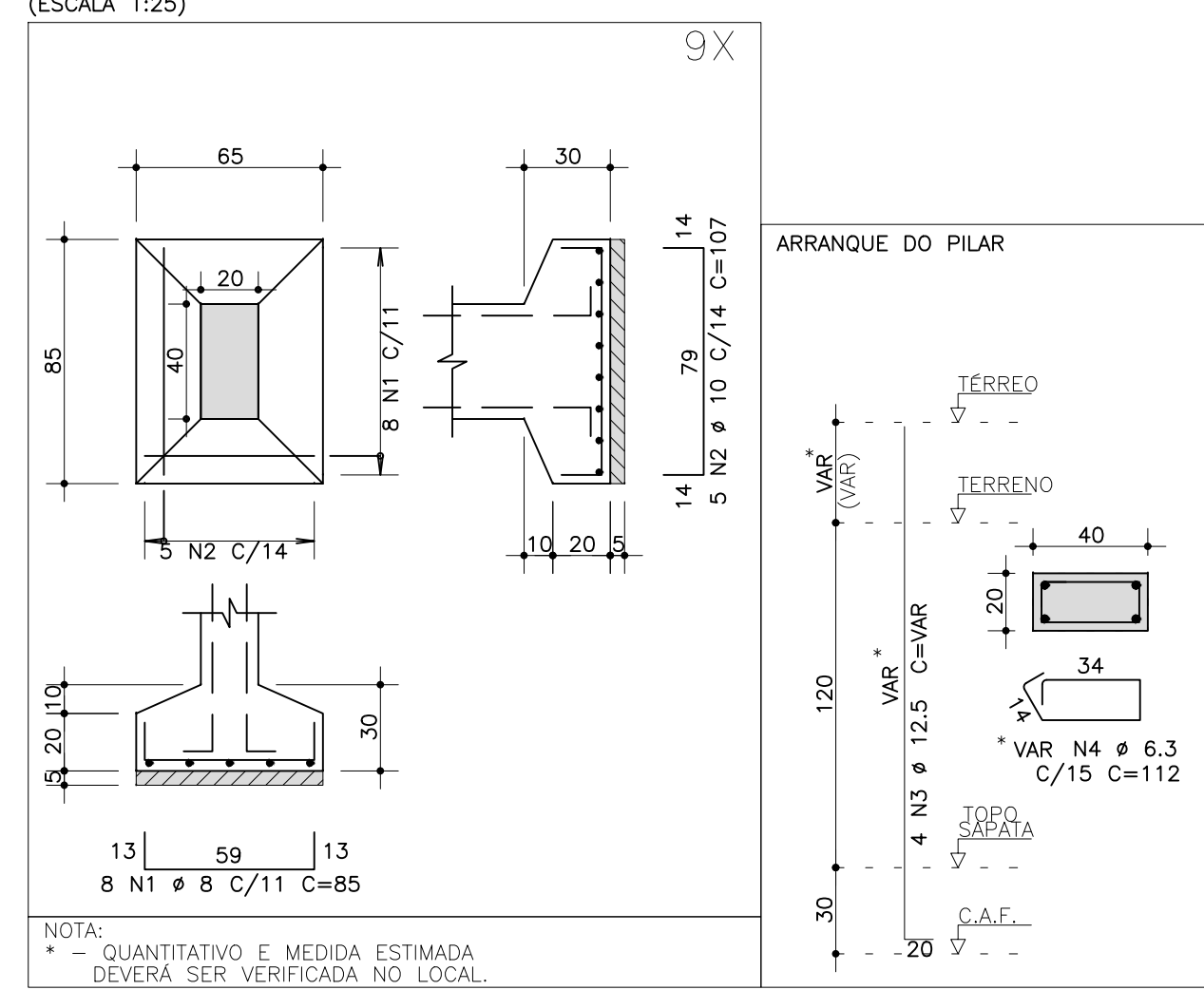
Assinado de forma
digital por THIAGO
EUGENIO DE MELO
DIAS:06364139698
Dados: 2025.11.14
17:57:42 -03'00'

		PREFEITURA MUNICIPAL DE IRUPI	
		CONSULTORIA AVANTEC SOLUÇÕES EM ENGENHARIA	
PROJETO EXECUTIVO DE ENGENHARIA E ARQUITETURA			
TÍTULO: PROJETO ESTRUTURAL ESCOLA POLO - ETAPA 01			
LOCAL: CORREGO BARRA GRANDE - IRUPI			
COORDENADOR	DESENHADOR	DESENHADOR	PROJETA
THIAGO EUGENIO DE MELO	THIAGO EUGENIO DE MELO	THIAGO EUGENIO DE MELO	THIAGO EUGENIO DE MELO
AUTOR DO PROJETO	REVISOR	DESENHADOR	PROJETA
THIAGO EUGENIO DE MELO	THIAGO EUGENIO DE MELO	THIAGO EUGENIO DE MELO	THIAGO EUGENIO DE MELO
DATA: 2025.11.14	DATA: 2025.11.14	DATA: 2025.11.14	DATA: 2025.11.14
ESCALA: 1:50	ESCALA: 1:50	ESCALA: 1:50	ESCALA: 1:50
FORMATO: A4	FORMATO: A4	FORMATO: A4	FORMATO: A4
PRIMEIRA	PRIMEIRA	PRIMEIRA	PRIMEIRA
EST.01-14			

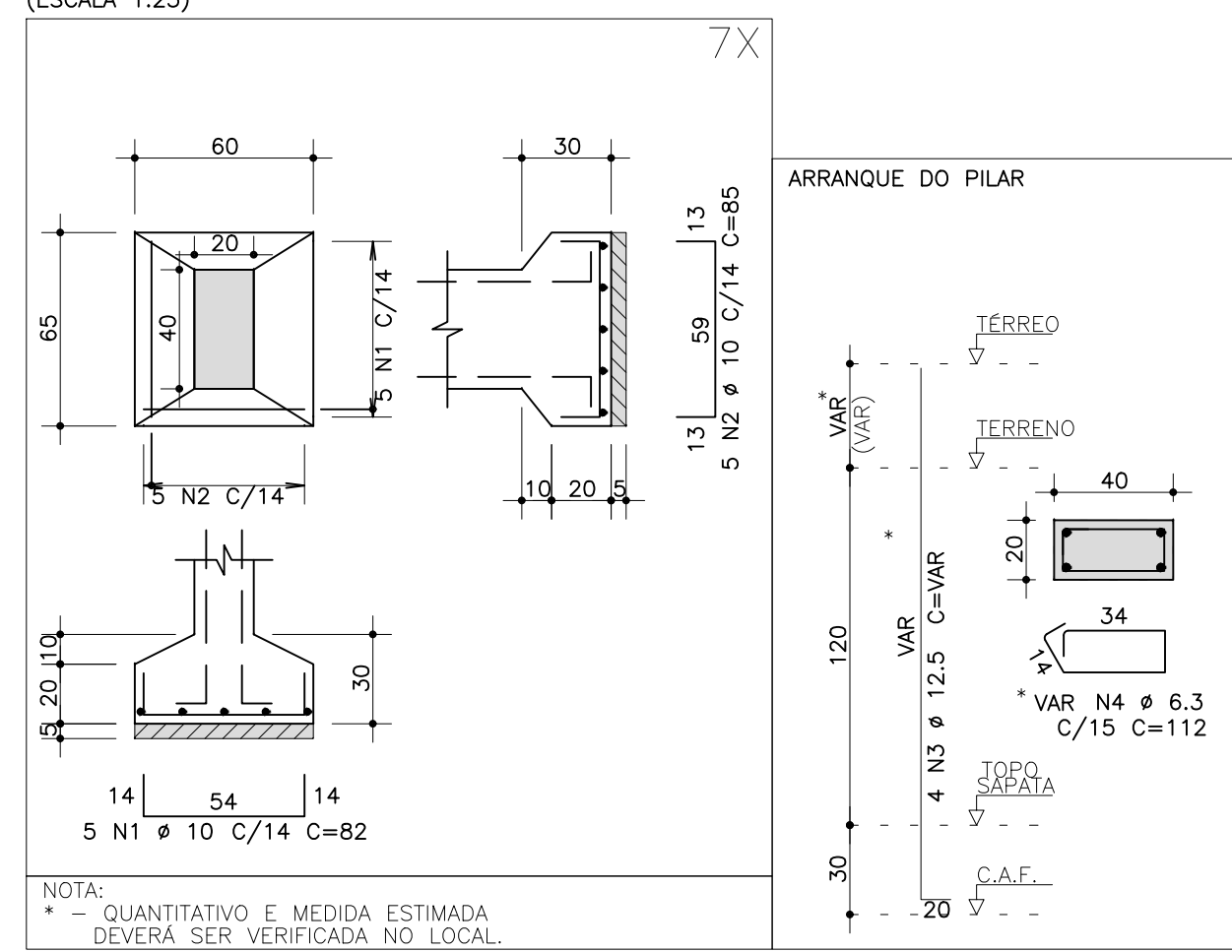
S32=P52=P51=P72=P90=P109



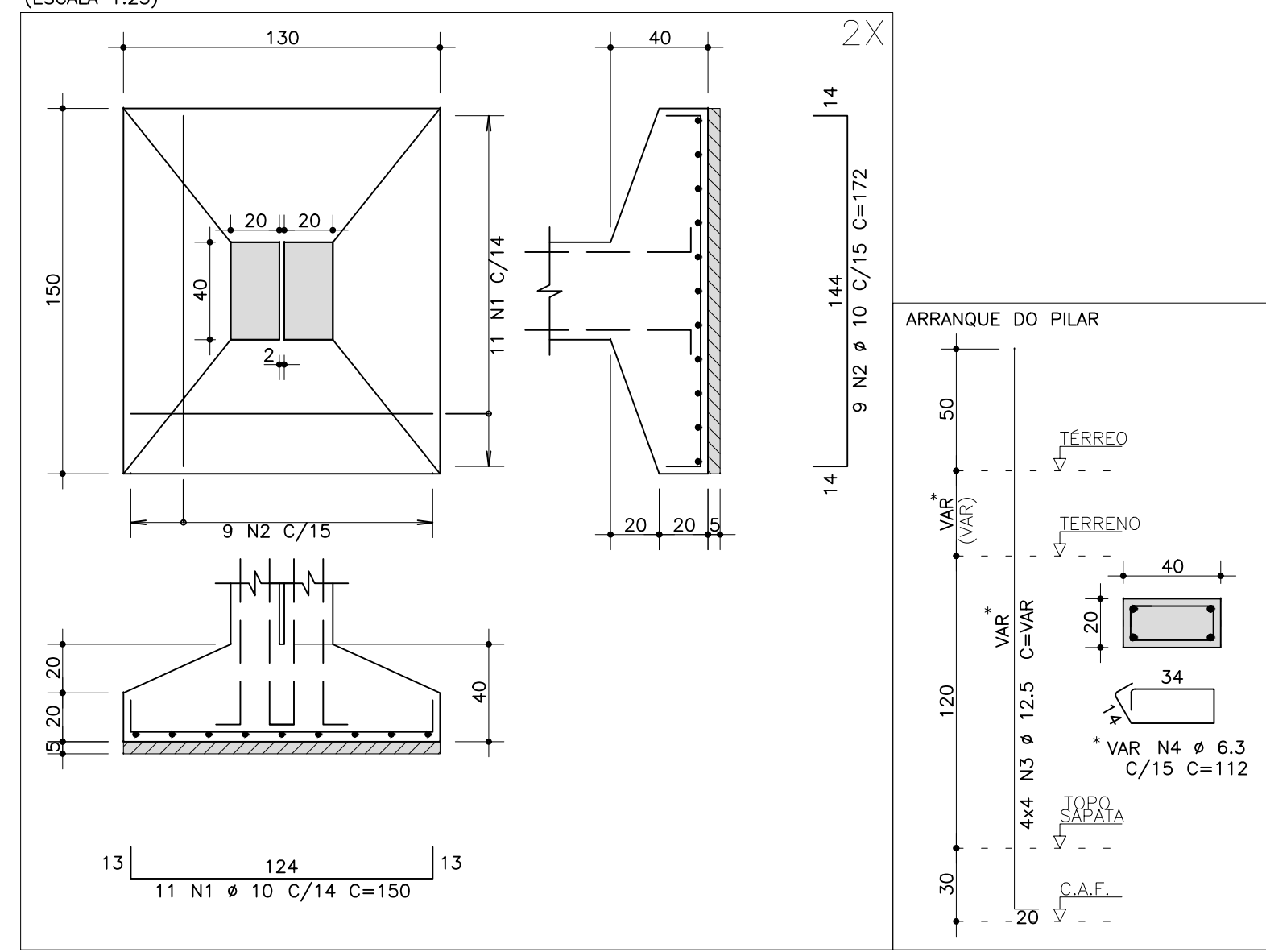
S8@S11=S14=S94@S96=S99



S12=S13=S15=S97=S98=S100=S101



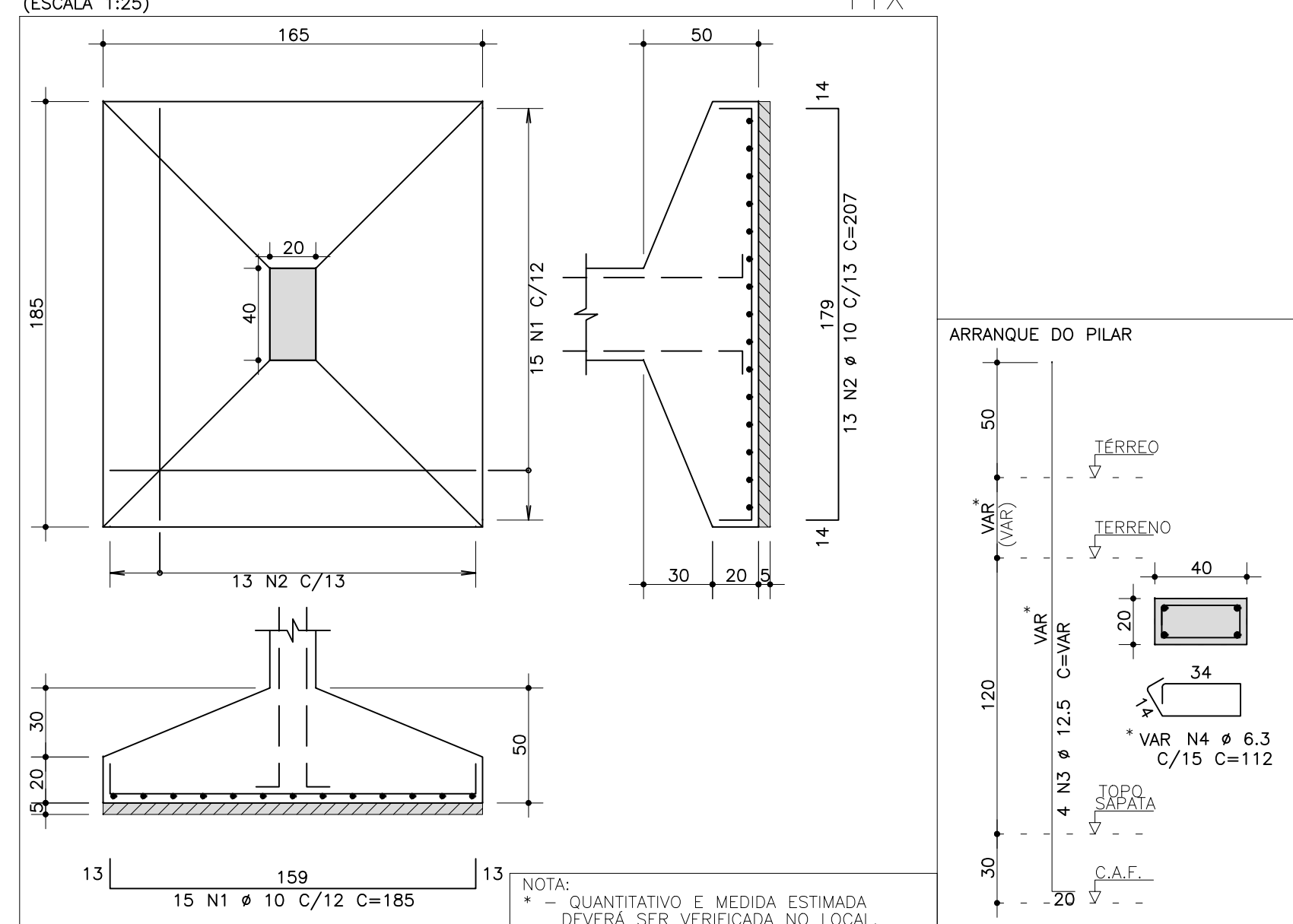
S22=S82



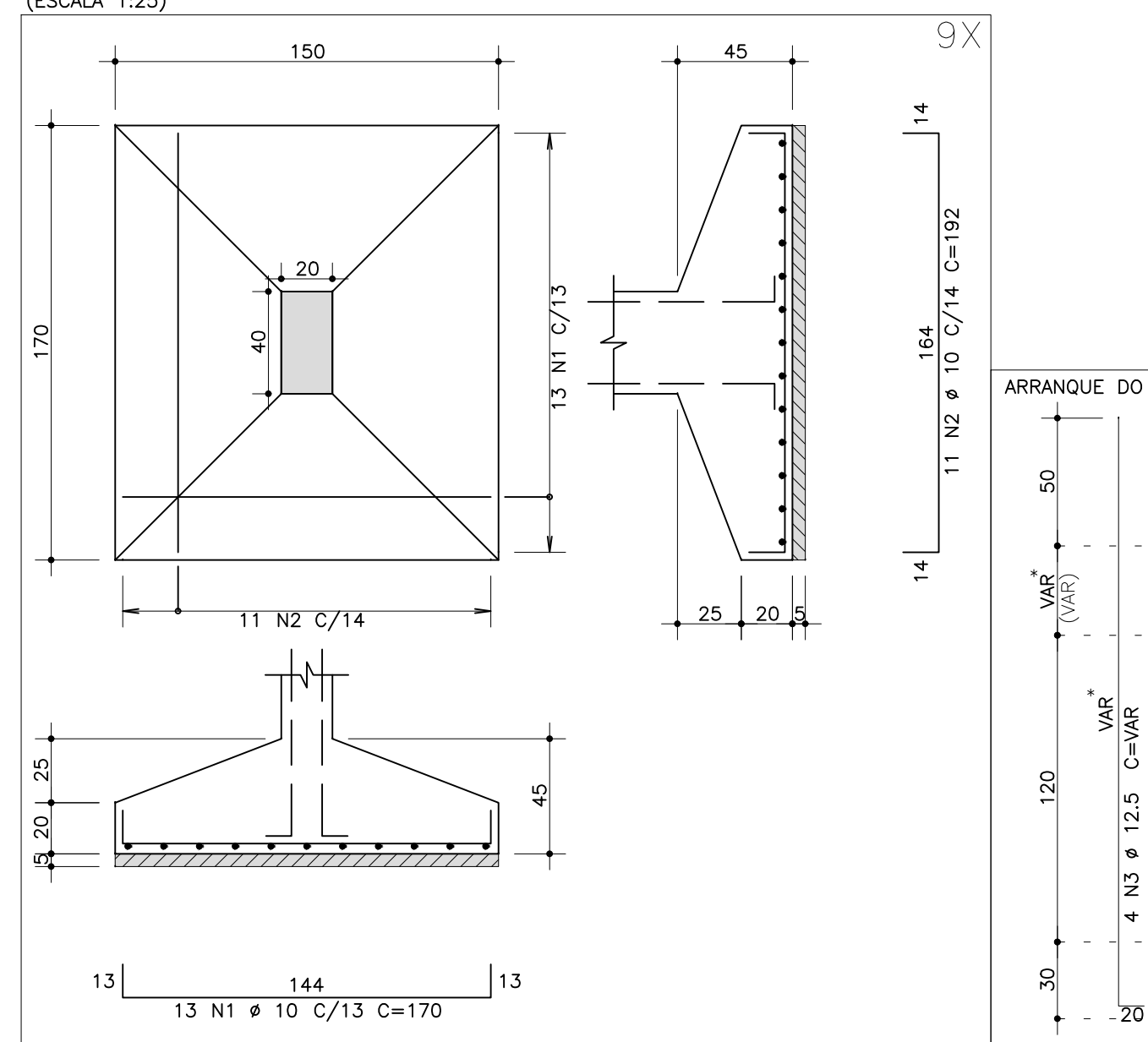
ACO	POS	BIT	QUANT	COMPRIMENTO	UNIT	TOTAL
		mm		cm		cm
S32=P52=P51=P72=P90=P109 (X6)						
50A	1	10	60	140	8400	
50A	2	10	162	140	8748	
50A	3	12.5	24	480	11520	
50A	4	6.3	234	112	26208	
S7=S108 (X2)						
50A	1	8	16	85	1360	
50A	2	10	107	107	1070	
50A	3	12.5	8	377	3016	
50A	4	6.3	79	112	8736	
S8@S11=S14=S94@S96=S99 (X9)						
50A	1	8	72	85	6120	
50A	2	10	45	107	4815	
50A	3	12.5	36	377	13572	
50A	4	6.3	351	112	39312	
S12=S13=S15=S97=S98=S100=S101 (X7)						
50A	1	10	35	82	2870	
50A	2	10	35	85	2975	
50A	3	12.5	28	377	10556	
50A	4	6.3	273	112	30576	
S22=S82 (X2)						
50A	1	10	22	150	3300	
50A	2	10	18	172	3096	
50A	3	12.5	32	480	15360	
50A	4	6.3	78	112	8736	
S23=S30=S35=S45@S47=S49=S66=S68=S70=S83 (X11)						
50A	1	10	165	185	30525	
50A	2	10	143	207	29601	
50A	3	12.5	44	480	21120	
50A	4	6.3	429	112	48048	
S24=S26=S34=S67=S84@S86=S89 (X9)						
50A	1	10	117	120	13860	
50A	2	10	99	192	19008	
50A	3	12.5	36	480	17280	
50A	4	6.3	351	112	39312	
S27=S29=S36=S48=S66=S69=S71=S74=S87 (X9)						
50A	1	10	108	160	17280	
50A	2	10	99	182	18018	
50A	3	12.5	36	480	17280	
50A	4	6.3	351	112	39312	
S31=S53=S55=S57=S91=S92 (X6)						
50A	1	10	60	130	7800	
50A	2	10	48	152	7296	
50A	3	12.5	24	480	11520	
50A	4	6.3	234	112	26208	
S33=S54=S56=S93 (X4)						
50A	1	10	32	105	3360	
50A	2	10	28	127	3556	
50A	3	12.5	16	480	7680	
50A	4	6.3	156	112	17472	
S37=S75=S88 (X3)						
50A	1	10	27	115	3105	
50A	2	10	21	137	2877	
50A	3	12.5	12	480	5760	
50A	4	6.3	117	112	13104	
S44						
50A	2	10	13	170	2210	
50A	3	12.5	8	182	2112	
50A	4	6.3	39	112	4368	
S28=S50=S73 (X3)						
50A	2	10	33	150	4950	
50A	3	12.5	12	480	5760	
50A	4	6.3	117	112	13104	
S65						
50A	1	10	12	160	1920	
50A	2	10	11	182	2002	
50A	3	12.5	8	480	3840	
50A	4	6.3	39	112	4368	

RESUMO DE AÇO				
ACO	BIT	COMPR	PESO	
	mm	m	kgf	
50A	6.3	3189	781	
50A	8	75	30	
50A	10	2154	1339	
50A	12.5	1481	1426	
Peso Total SOA =			3566 kgf	

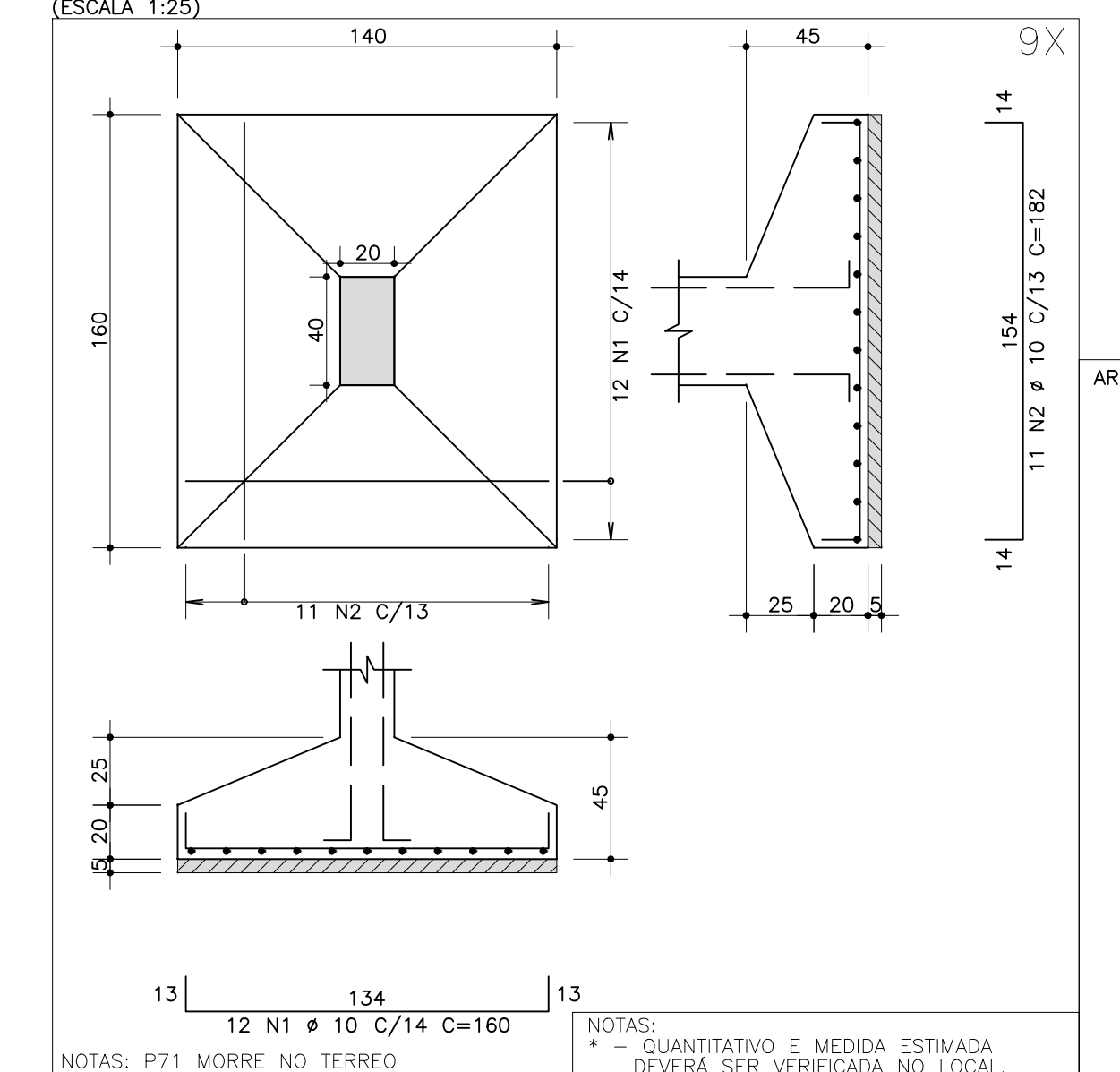
S23=S30=S35=S45@S47=S49=S66=S68=S70=S83



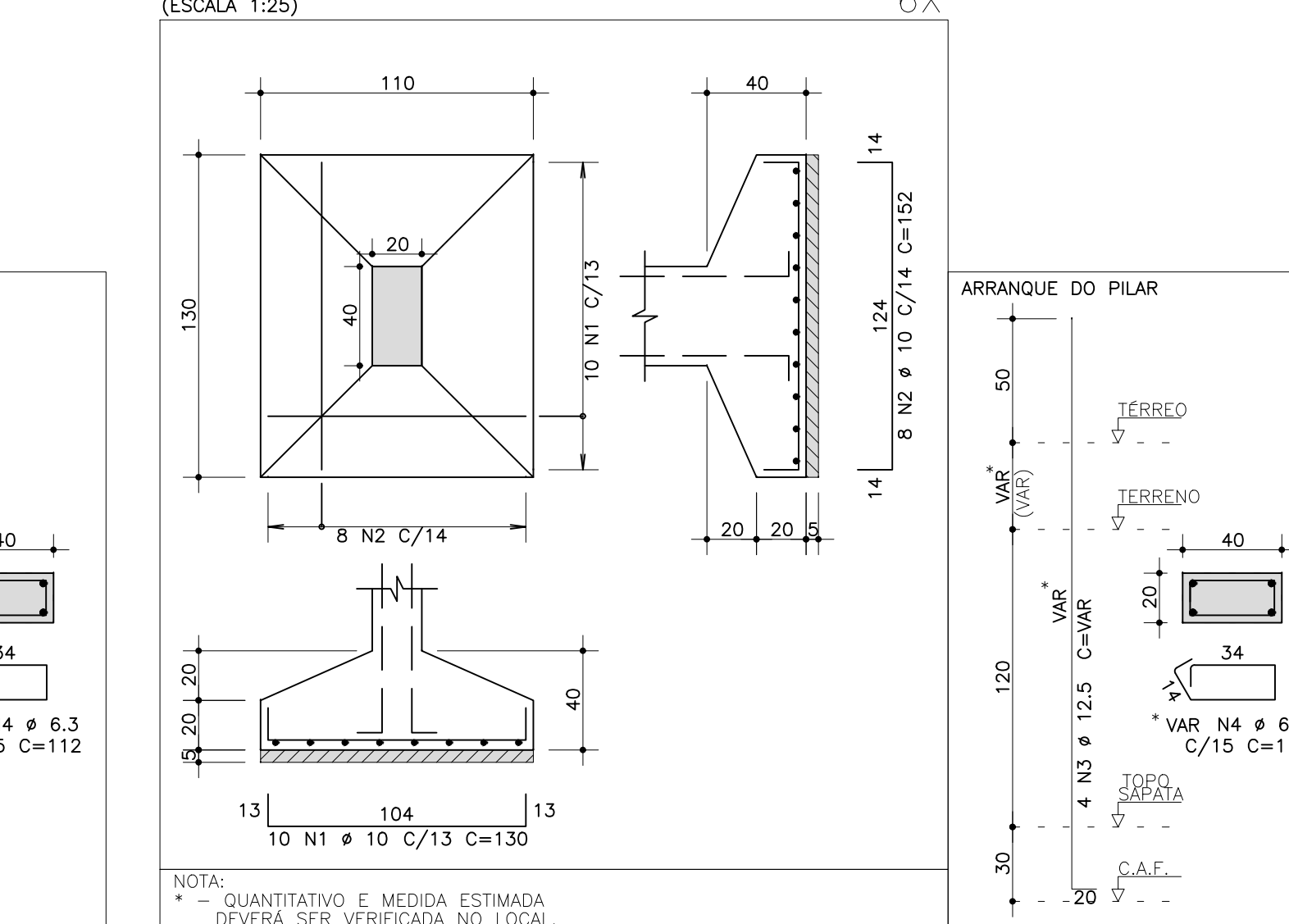
S24=@S26=S34=S67=S84@S86=S89



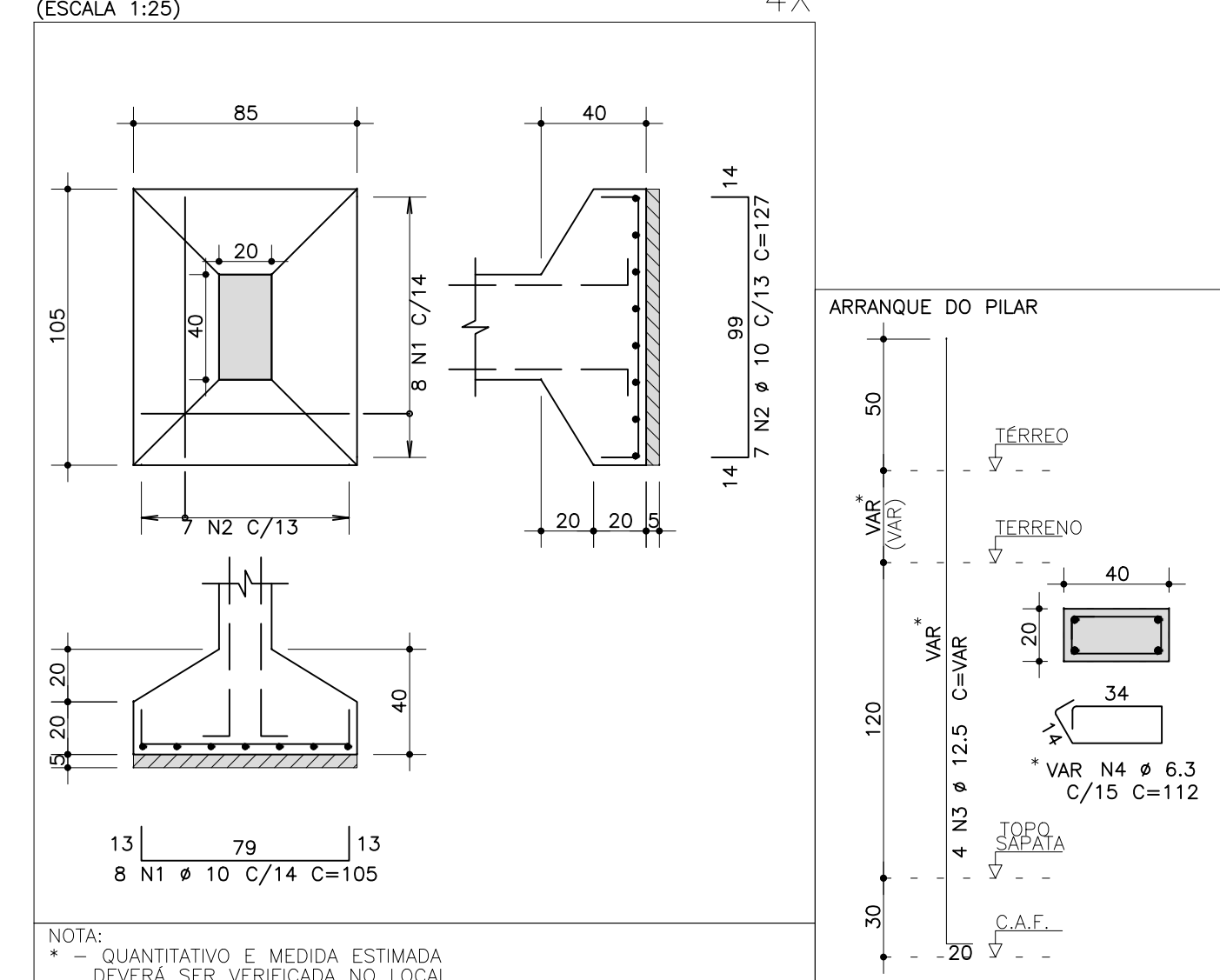
S27=S29=S36=S48=S56=S69=S71=S74=S87



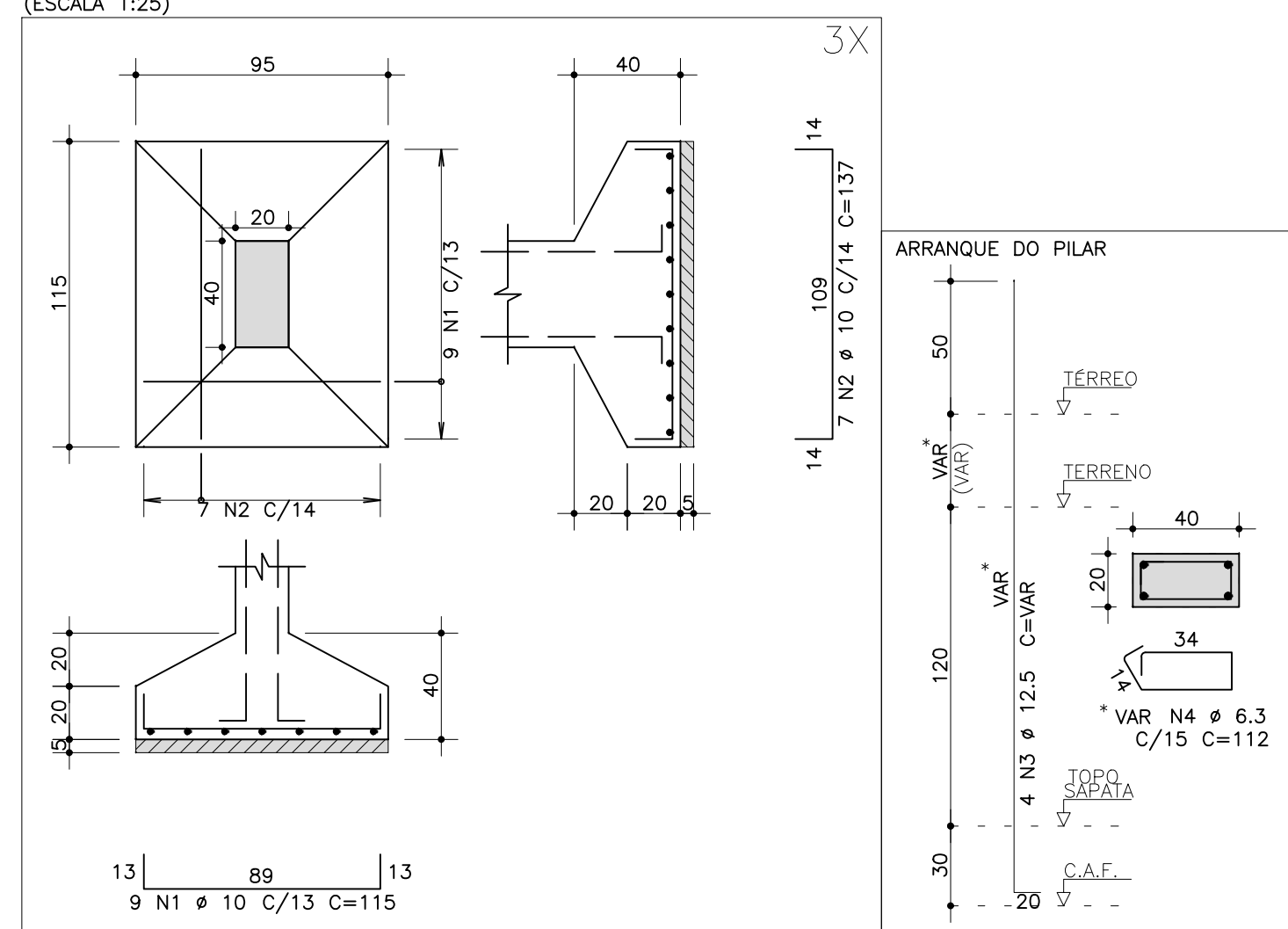
S31=S53=S55=S57=S91=S92



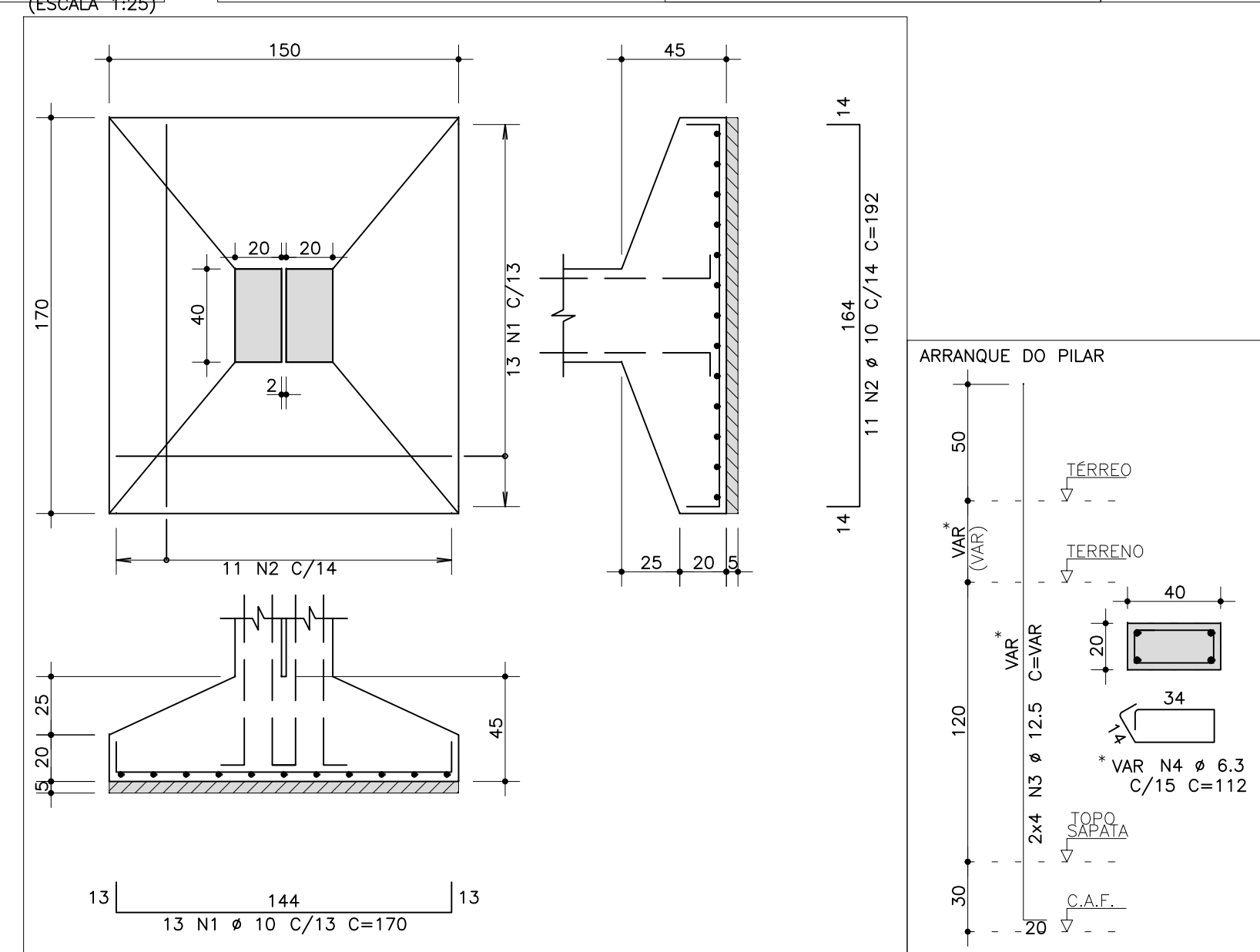
S33=S54=S58=S93



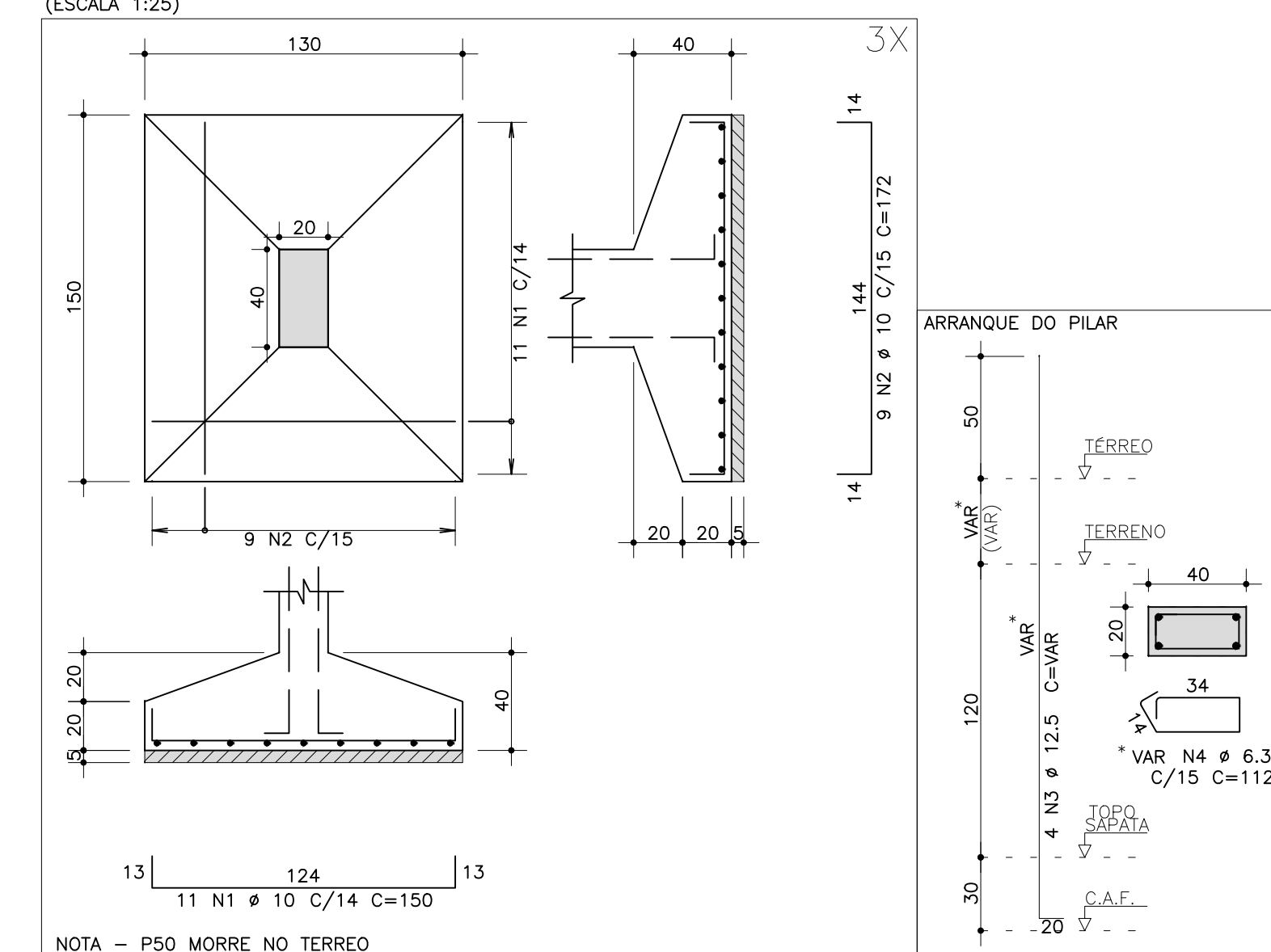
S37=S75=S88



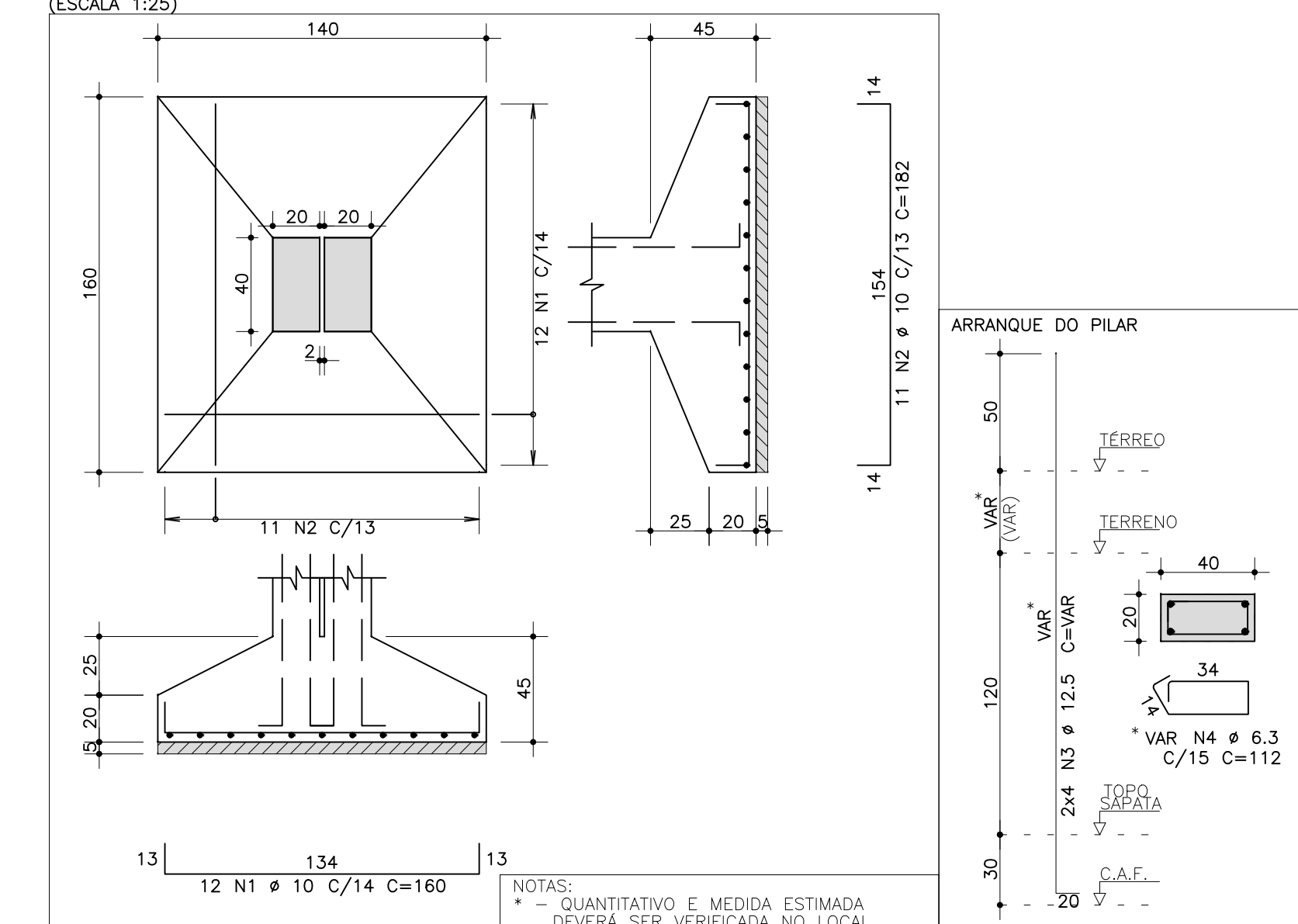
S44



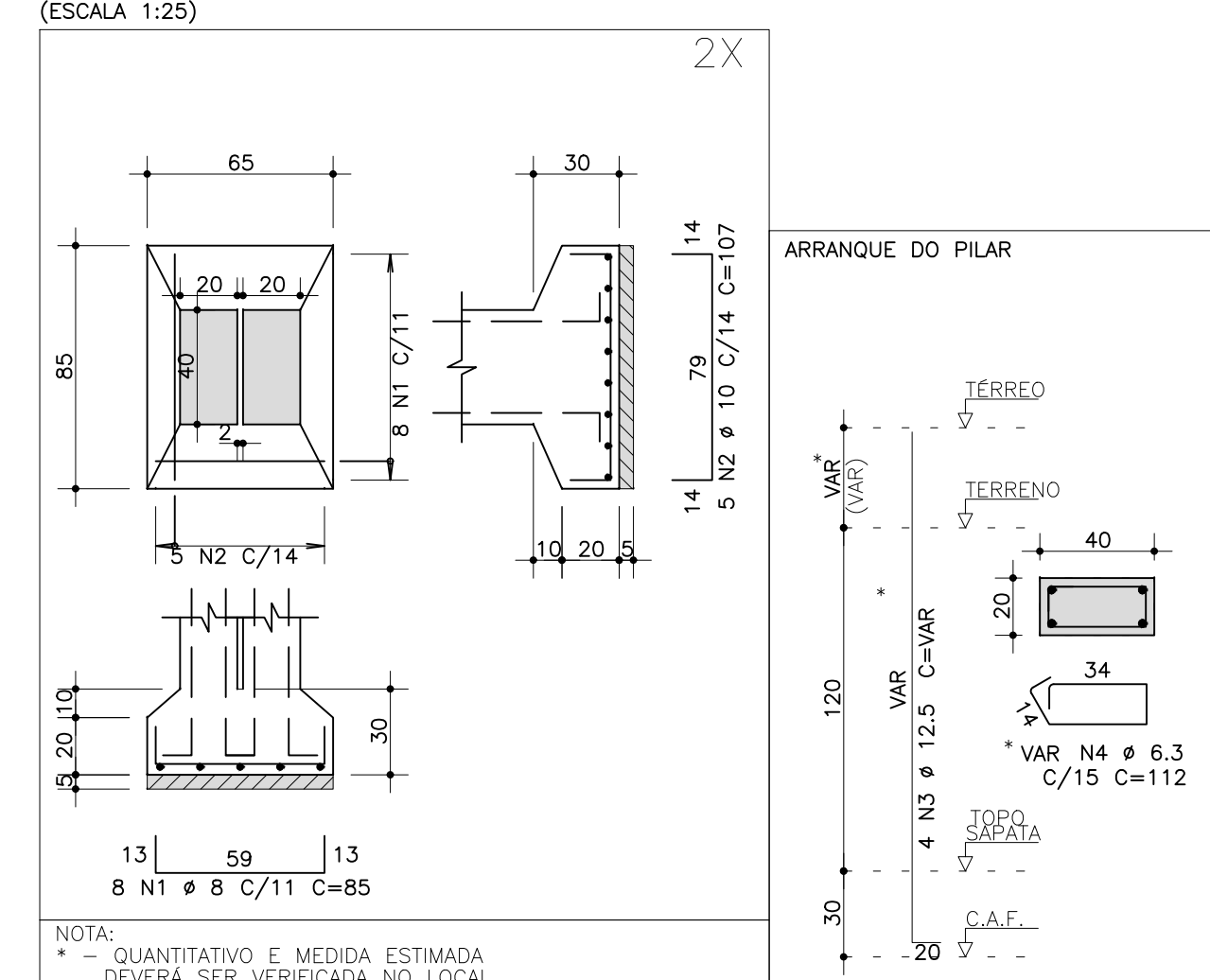
S28=S50=S73



S65



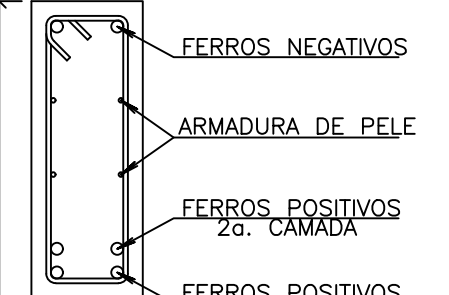
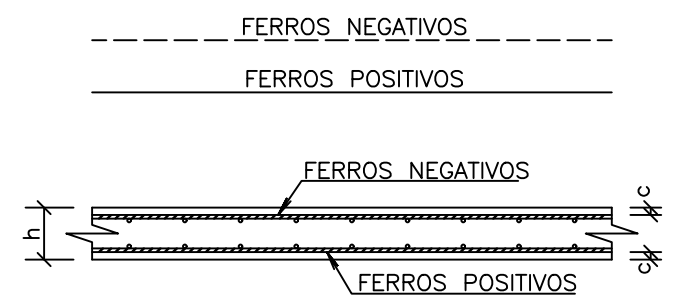
S7=S108



DET. ARMAÇÃO DAS SAPATAS
(ESCALA 1:50)

LEGENDA

CONVENÇÃO ARMADURA PARA LAJES:



h--> espessura da laje
c--> comprimento das armaduras
b--> largura da viga
h--> altura da viga

NOTA:

- 1 - COTAS E DIMENSÕES EM CM.
- 2 - CONFIRMAR MEDIDAS NO LOCAL.
- 3 - AS COTAS PREVALECEM SOBRE O DESENHO.
- 4 - CONCRETO:

4.1 - PROPRIEDADES EXIGIDAS

ELEMENTOS ESTRUTURAIS EM GERAL				
PROPRIEDADE	LAJES	VIGAS	PARAPIS	UNIDADE
Resistência característica (fck)	30	30	30	MPa
Consumo mínimo de cimento	300	300	300	Kg/m ³
Fator água-cimento	0.50	0.50	0.50	-

5 - AÇOS:

CA-50: f_{yk} = 500 MPa

CA-60: f_{yk} = 600 MPa

6 - COBRIMENTO DAS ARMADURAS:

Pilares: 3.0 cm

Lajes: 2.5 cm

Vigas: 3.0 cm

Sapatas: 5.0 cm

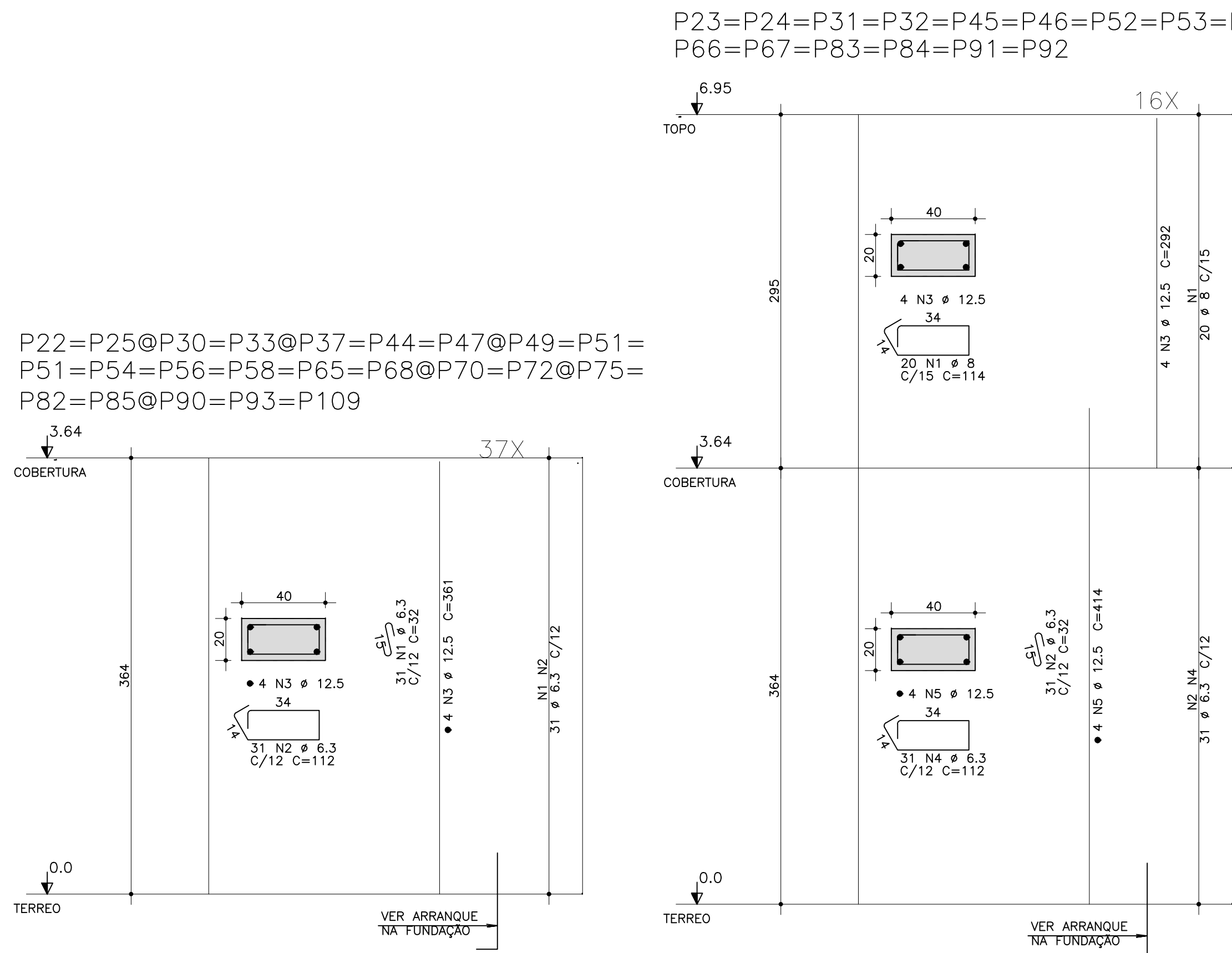
Tolerância para o cobrimento: 0.5 cm

DOBRAMENTO DAS BARRAS SEM ESCALA

DIAMETRO DE DOBRAMENTOS	VALORES	
BITOLA	TRANSPASSE	
< 20	5d	5d
20	5d	5d
25	5d	5d
30	5d	5d
35	5d	5d
40	5d	5d
45	5d	5d
50	5d	5d
55	5d	5d
60	5d	5d
65	5d	5d
70	5d	5d
75	5d	5d
80	5d	5d
85	5d	5d
90	5d	5d
95	5d	5d
100	5d	5d
105	5d	5d
110	5d	5d
115	5d	5d
120	5d	5d
125	5d	5d
130	5d	5d
135	5d	5d
140	5d	5d
145	5d	5d
150	5d	5d
155	5d	5d
160	5d	5d
165	5d	5d
170	5d	5d
175	5d	5d
180	5d	5d
185	5d	5d
190	5d	5d
195	5d	5d
200	5d	5d
205	5d	5d
210	5d	5d
215	5d	5d
220	5d	5d
225	5d	5d
230	5d	5d
235	5d	5d
240	5d	5d
245	5d	5d
250	5d	5d

		PREFEITURA MUNICIPAL DE IRUPI			
		AVANTEC SOLUÇÕES EM ENGENHARIA			
CONCESSIONÁRIA		PROJETO EXECUTIVO DE ENGENHARIA E ARQUITETURA			
TÍTULO:		PROJETO ESTRUTURAL, ESCOLA POLO - ETAPA 01			
LOCAL:		CORRÊGO BARRA GRANDE - IRUPIES			
COORDENADOR:		CREA	ESCALA	FORMATO	FRANCA
		MG arq-01/d	REDUÇÃO	A4	
AUTOR DO PROJETO:		CREA	REVISOR	R.O.	EST 02-
		MG arq-01/d	DATA		

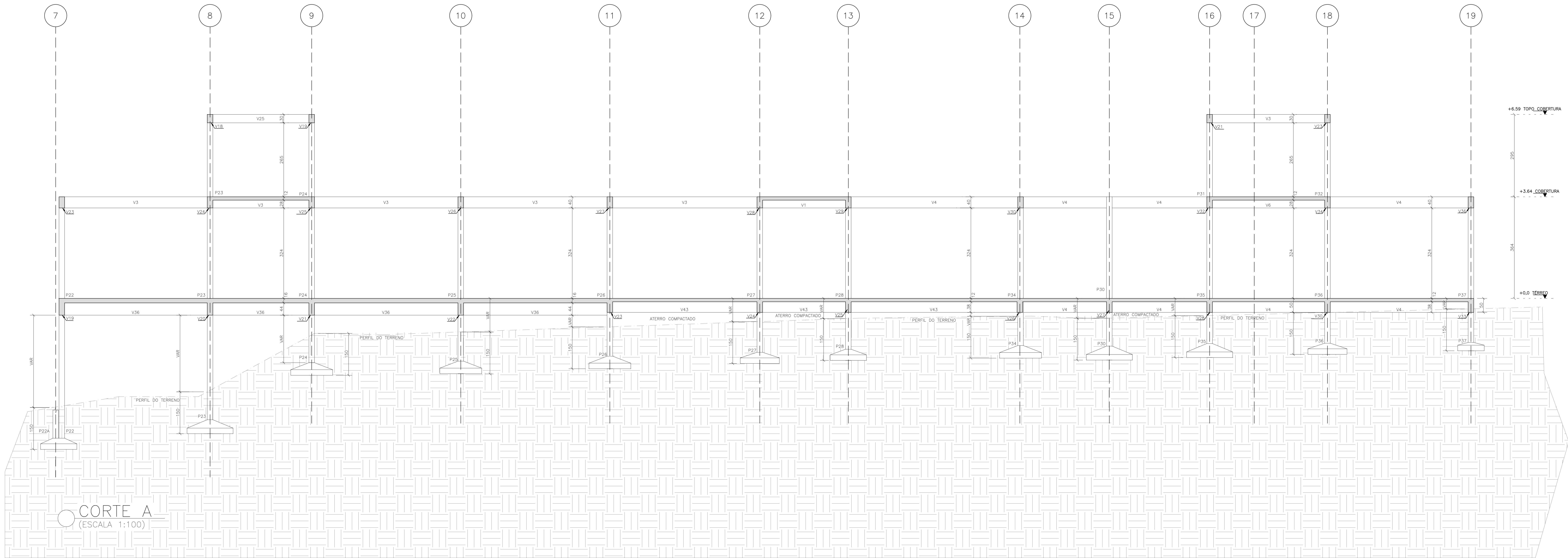
QUANTITATIVOS DE FORMA E CONCRETO - FUNDAÇÃO		
ELEMENTOS	ÁREA DE FORMA (m ²)	VOLUME DE CONCRETO (m ³)
SAPATAS	68.00	34.76
TOTAL	68.00	34.76



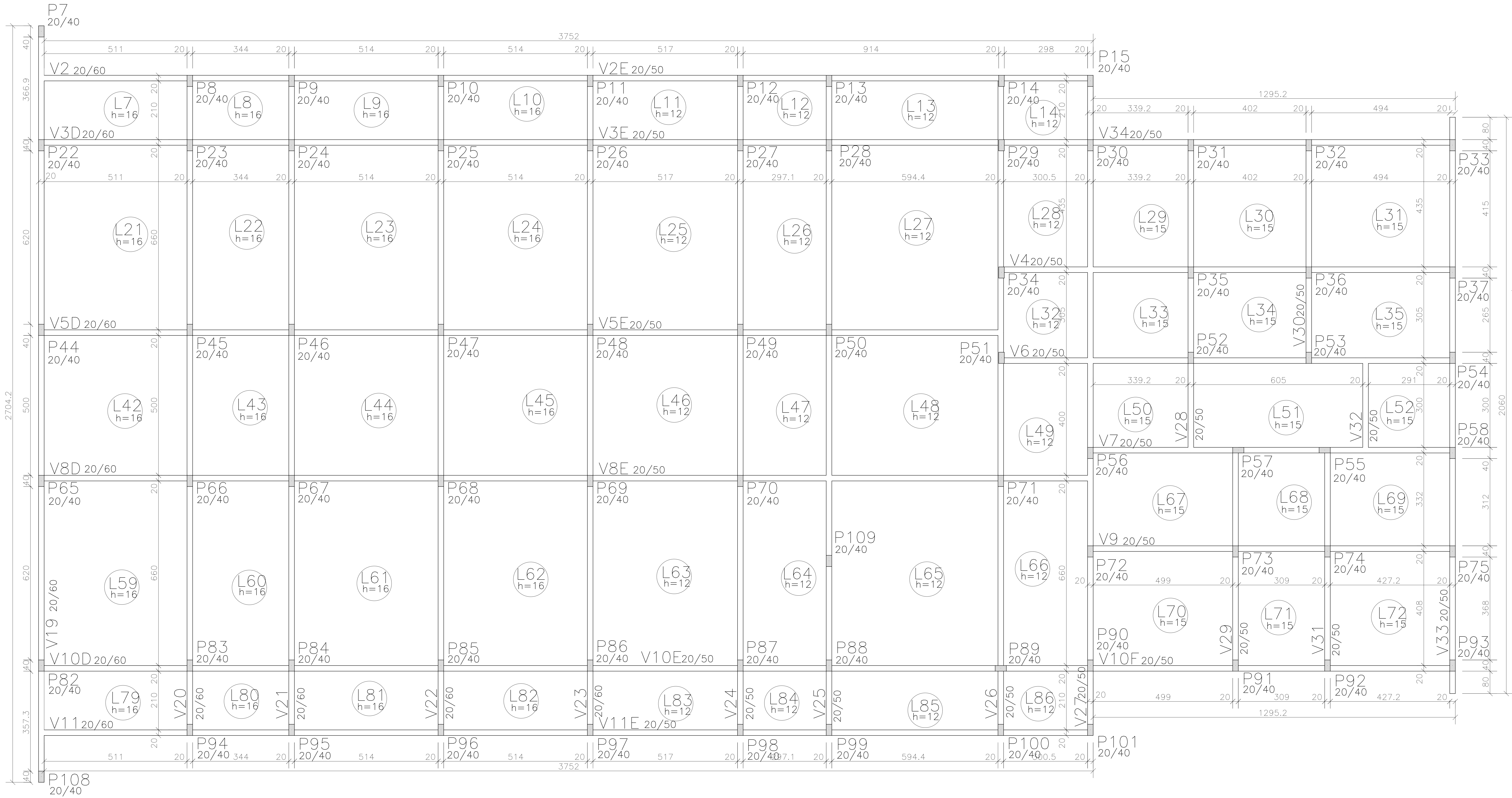
AÇO	POS	BIT	QUANT	COMPRIMENTO
		mm		UNIT TOTAL
				cm cm
P22=P25@P30=P33@P37=... (X37)				
50A	1	6.3	1147	32 36704
50A	2	6.3	1147	112 128454
50A	3	12.5	148	361 53428
P23=P24=P31=P32=P45=... (X16)				
50A	1	6	320	114 36480
50A	2	6.3	496	32 15872
50A	3	12.5	64	292 18688
50A	4	6.3	496	112 55552
50A	5	12.5	64	414 26496

RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
		m	kgf
50A	6.3	2396	580
50A	8	365	144
50A	12.5	986	350
Peso Total 50A =			1673 kgf

PILARES EM TODA SUA ALTURA
(ESCALA.: INDICADA)



CORTE A
(ESCALA 1:100)



FORMAS DO TERREO – ETAPA 1
(ESCALA 1:50)

QUANTITATIVOS DE FORMA E CONCRETO – TÉRREO		
ELEMENTOS	ÁREA DE FORMA (m2)	VOLUME DE CONCRETO (m3)
PILARES	608.00	40.48
VIGAS	695.21	70.57
LAJES	1091.00	142.70
TOTAL	2394.20	253.75



PREFEITURA MUNICIPAL DE IRUPI



CONSULTORIA

AVANTEC SOLUÇÕES EM ENGENHARIA

TÍTULO

PROJETO EXECUTIVO DE ENGENHARIA E ARQUITETURA

LOCAL

CORREGO BARRA GRANDE - IRUPI

COORDENADOR

PROF. CARLOS EDUARDO DE MELLO GAS

AUTOR DO PROJETO

PROF. CARLOS EDUARDO DE MELLO GAS

CREA

MS-00000000

ESCALA

1:50

FORMATO

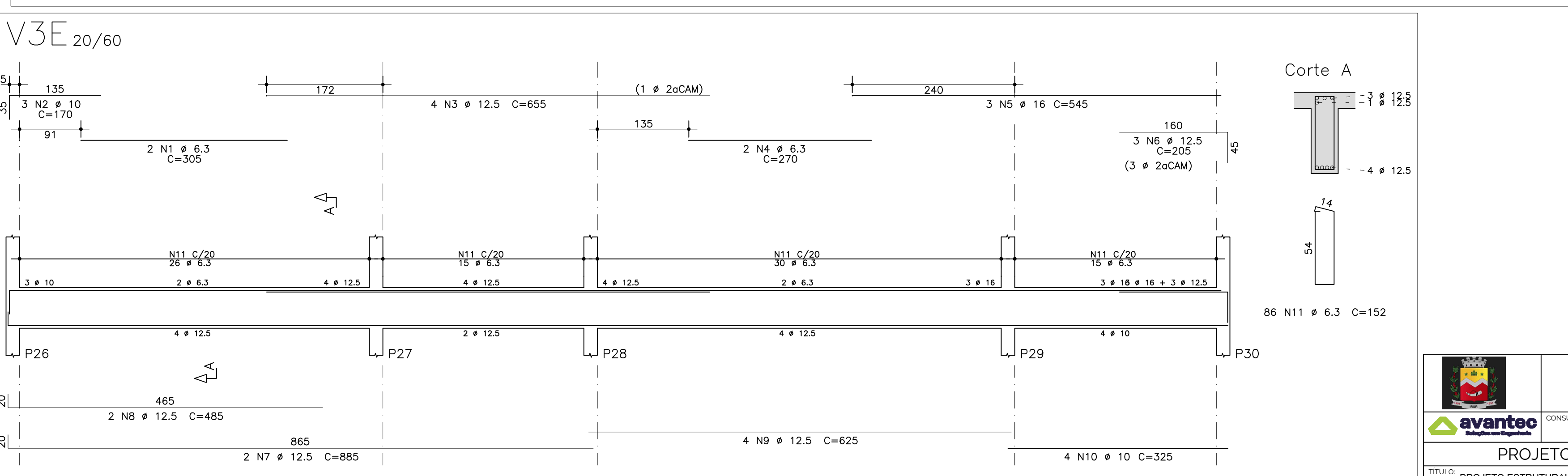
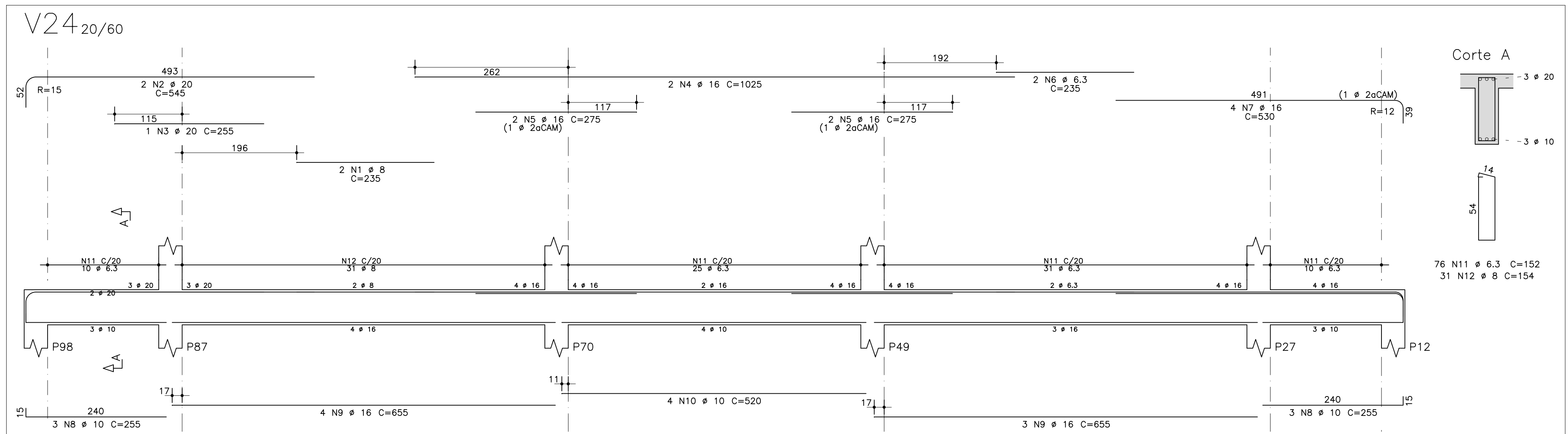
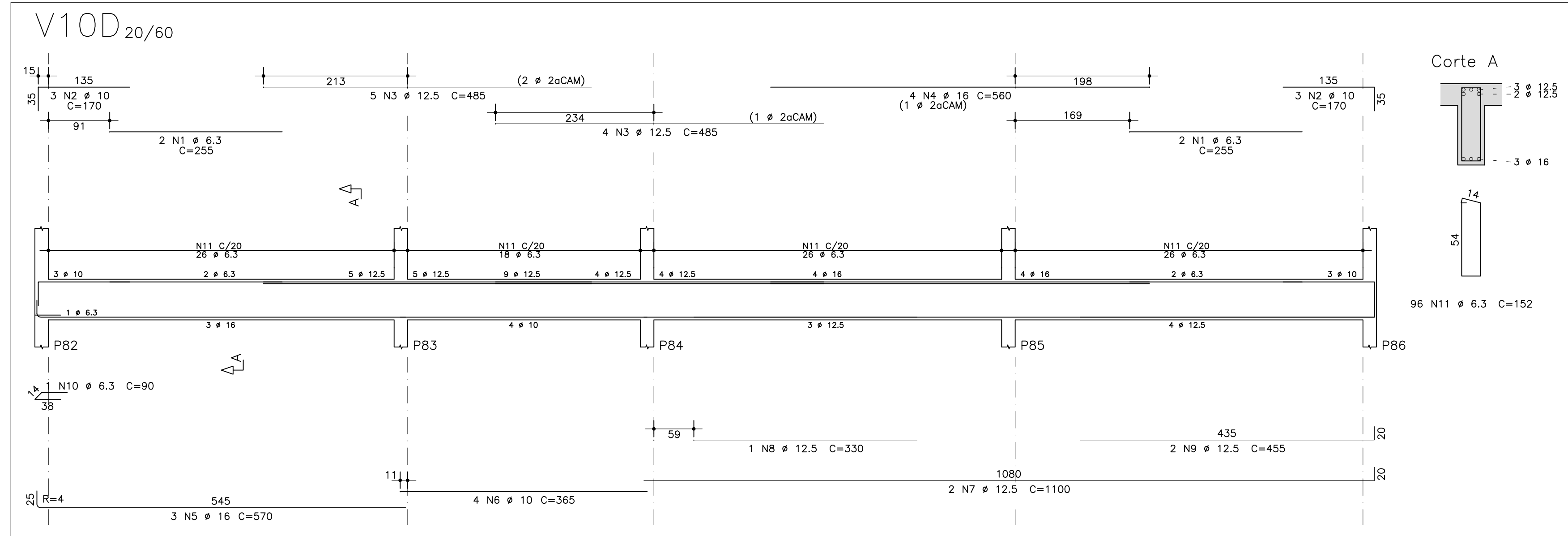
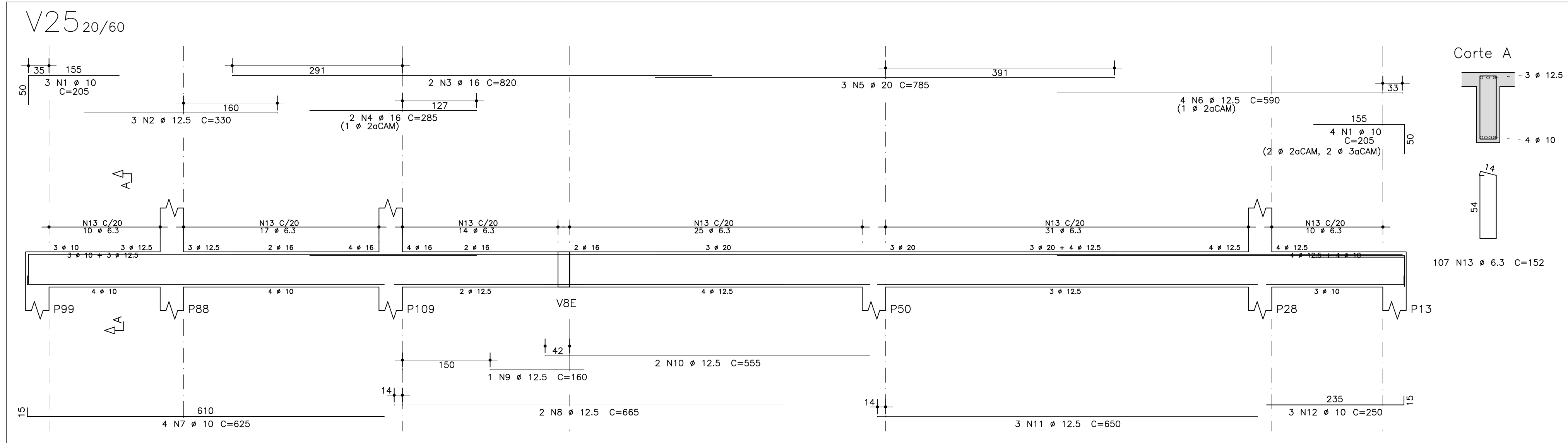
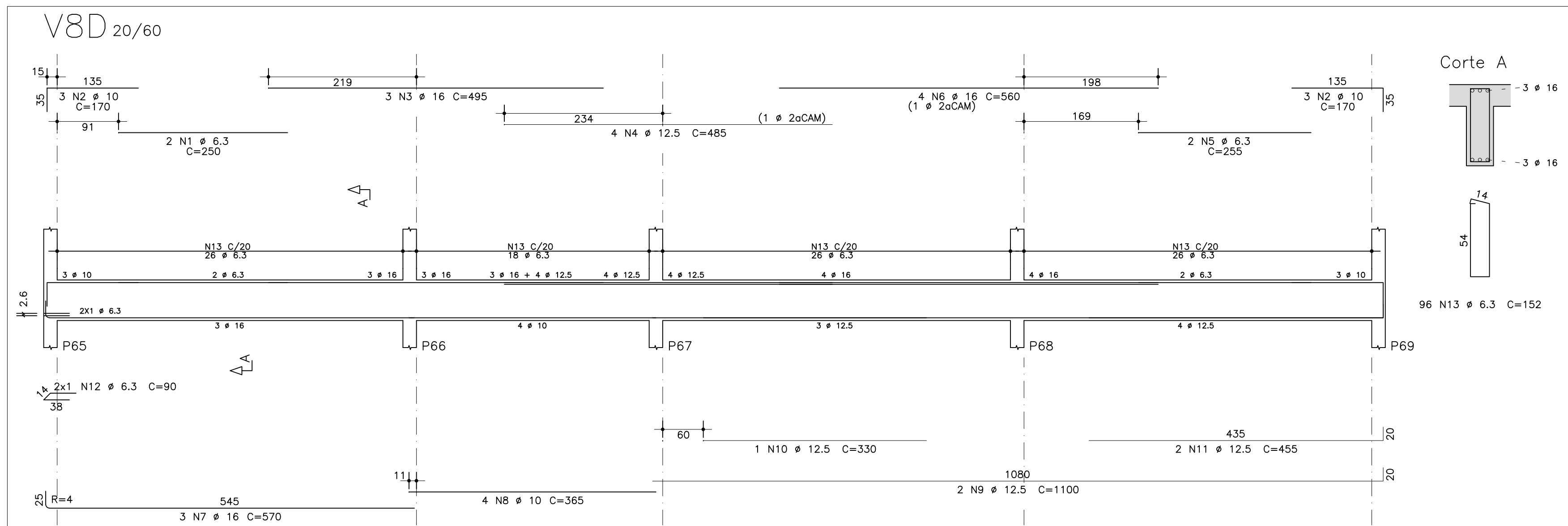
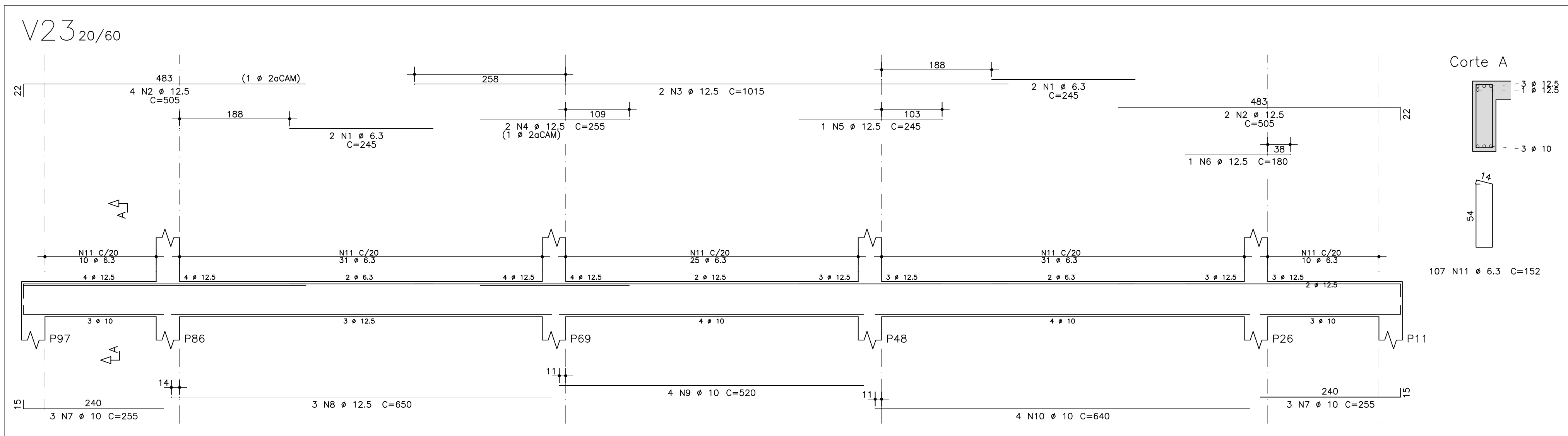
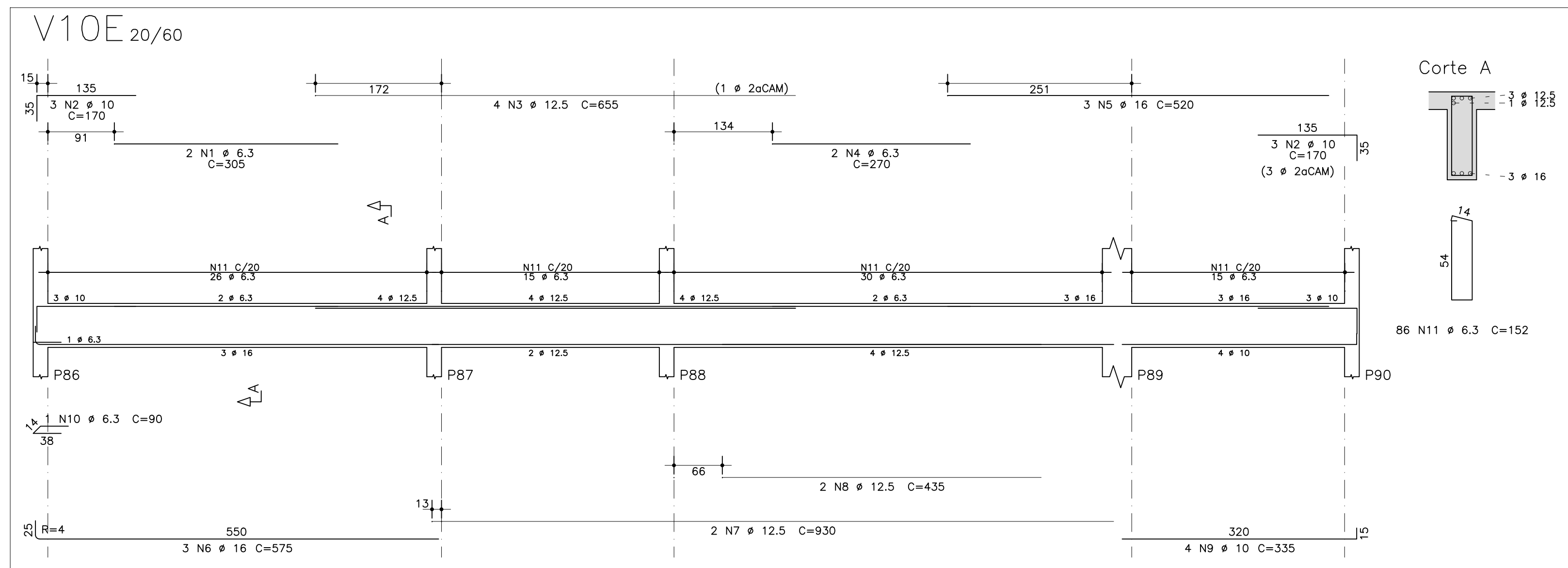
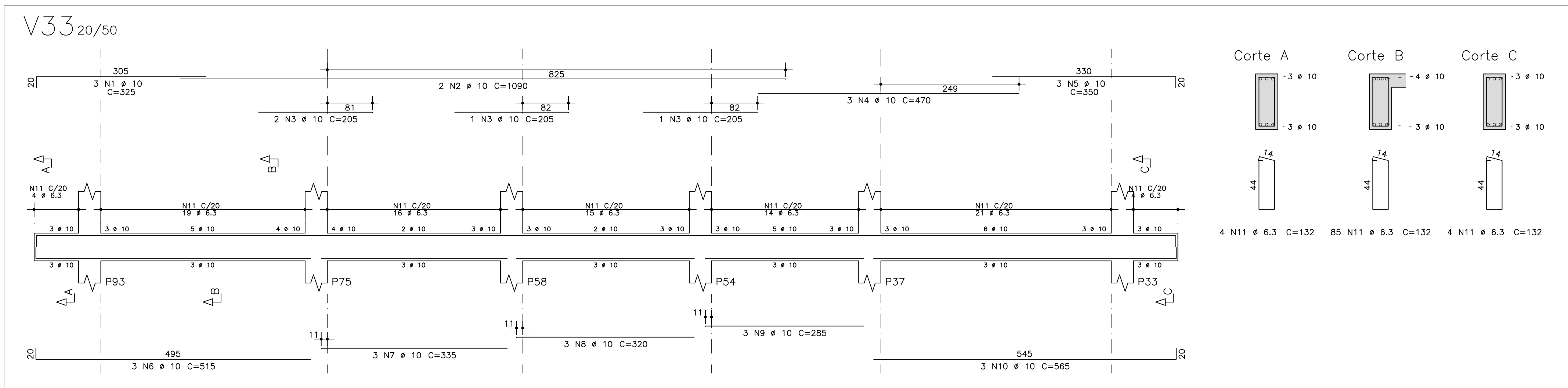
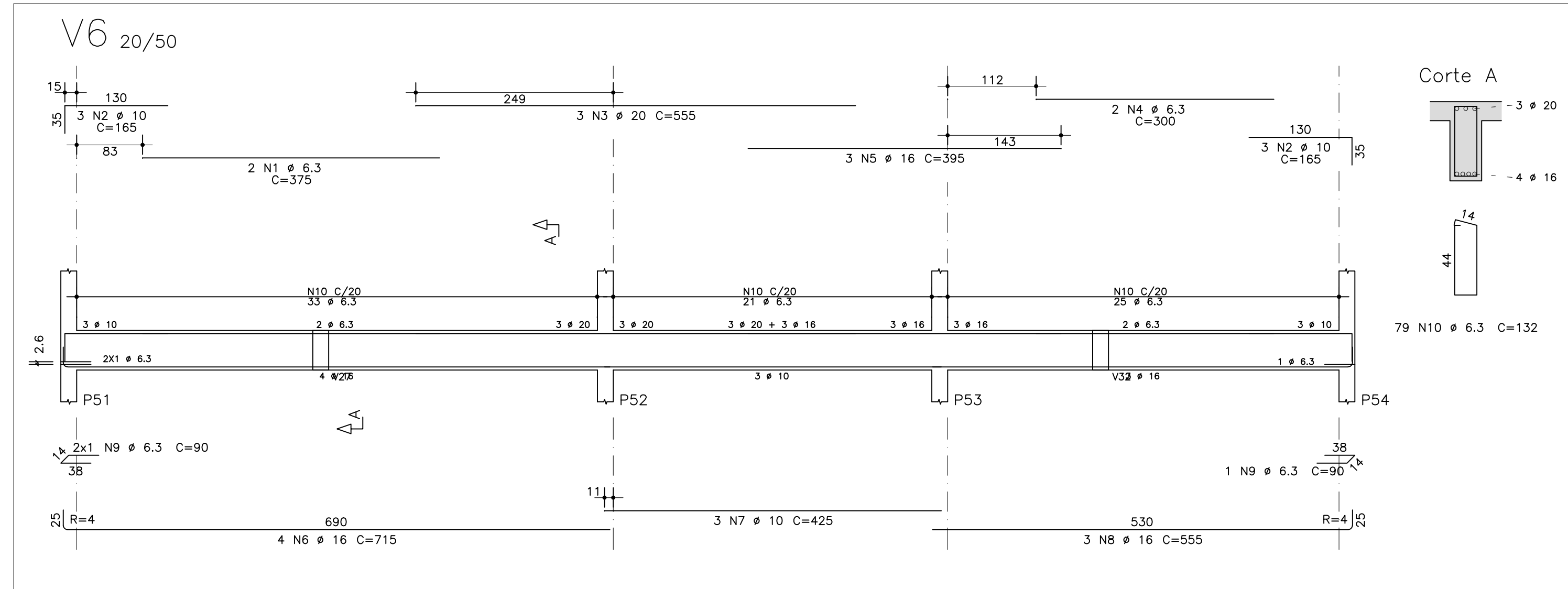
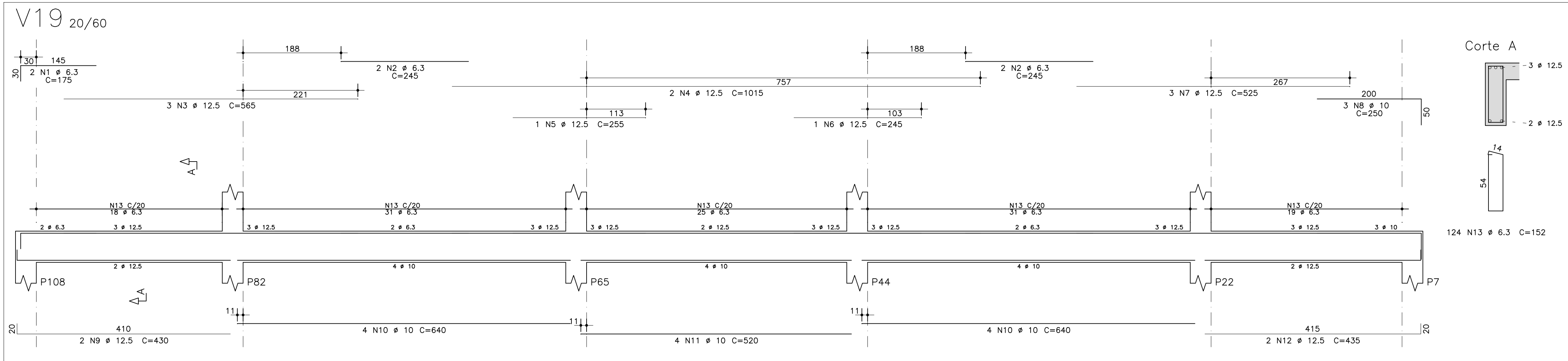
A3

PLANCHAS

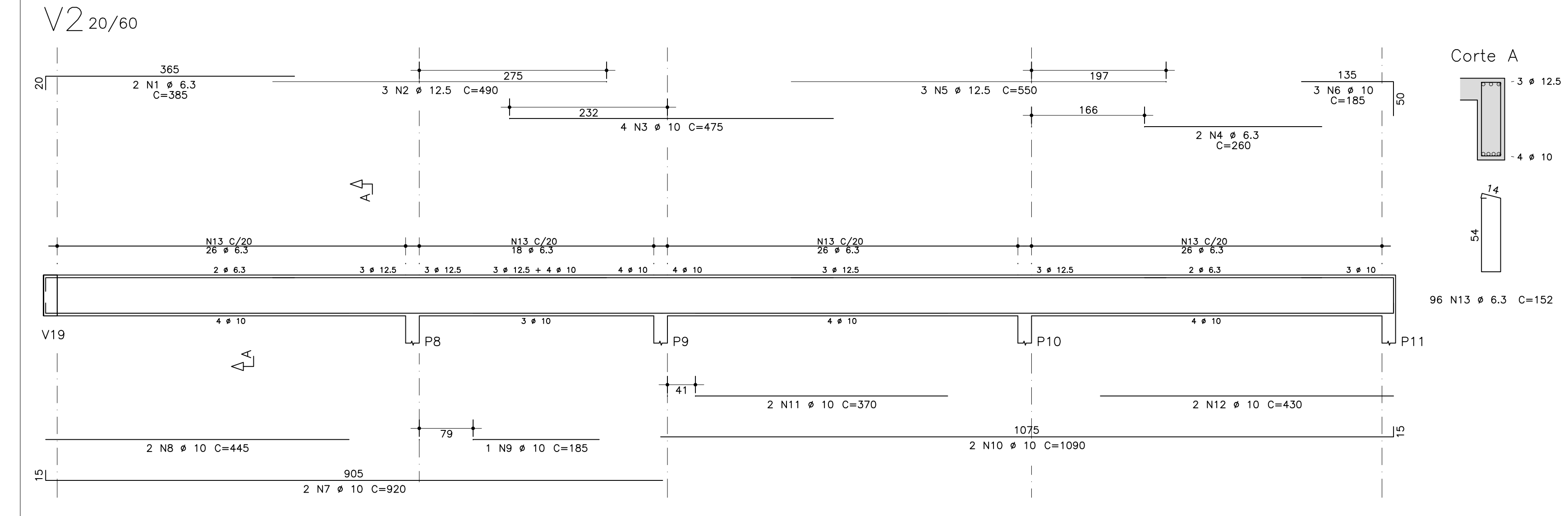
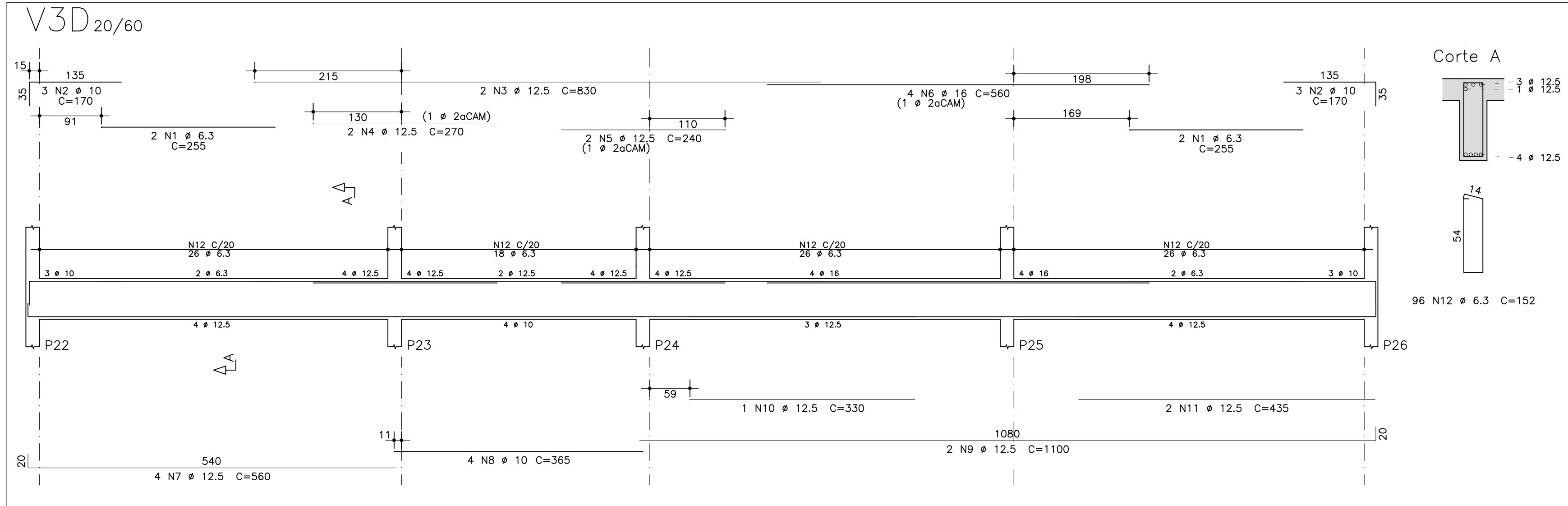
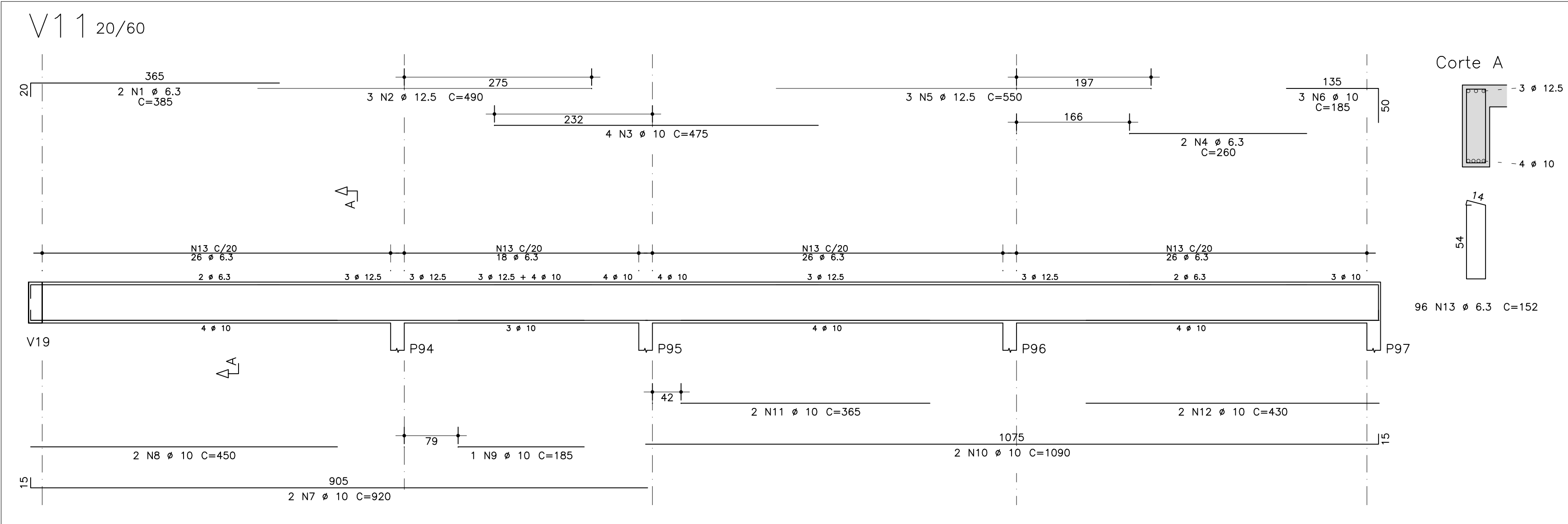
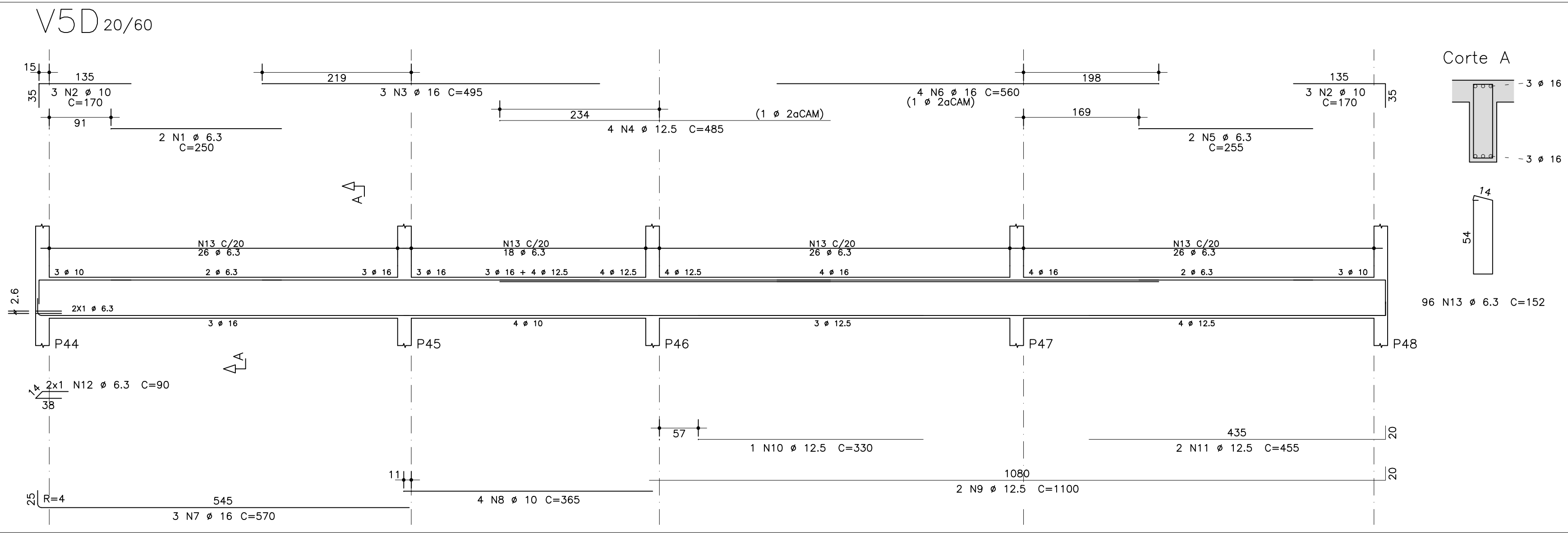
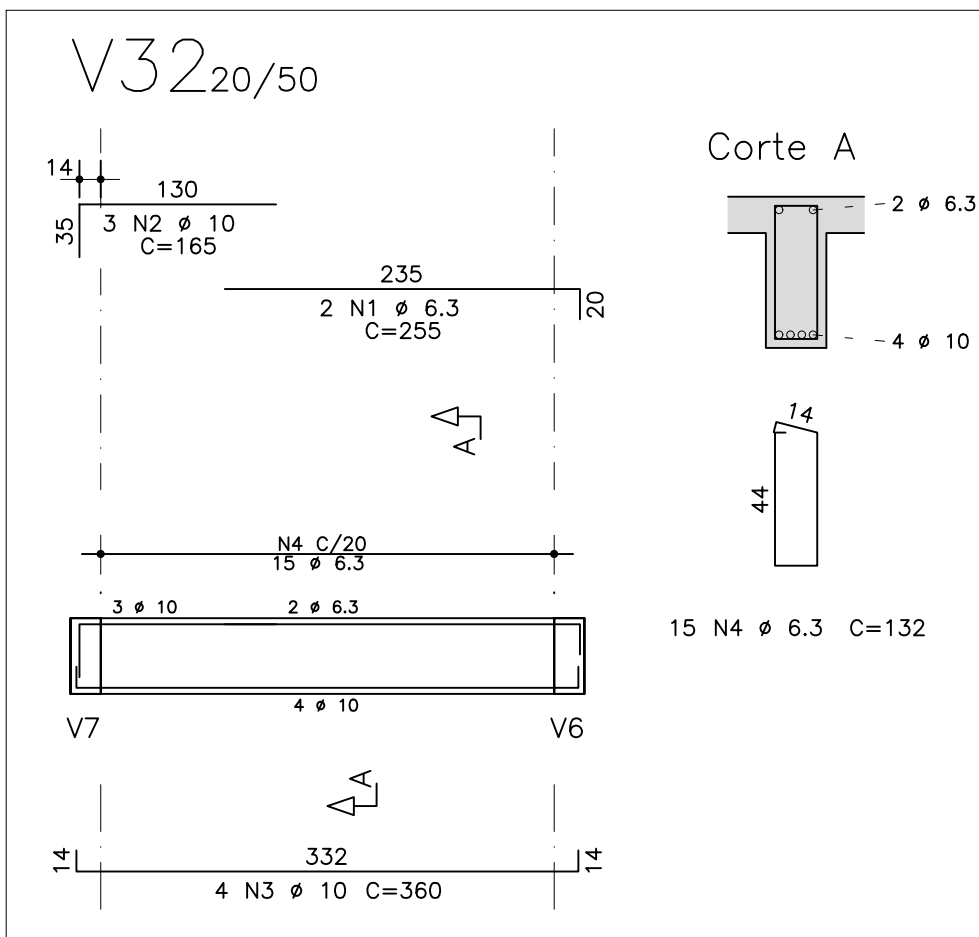
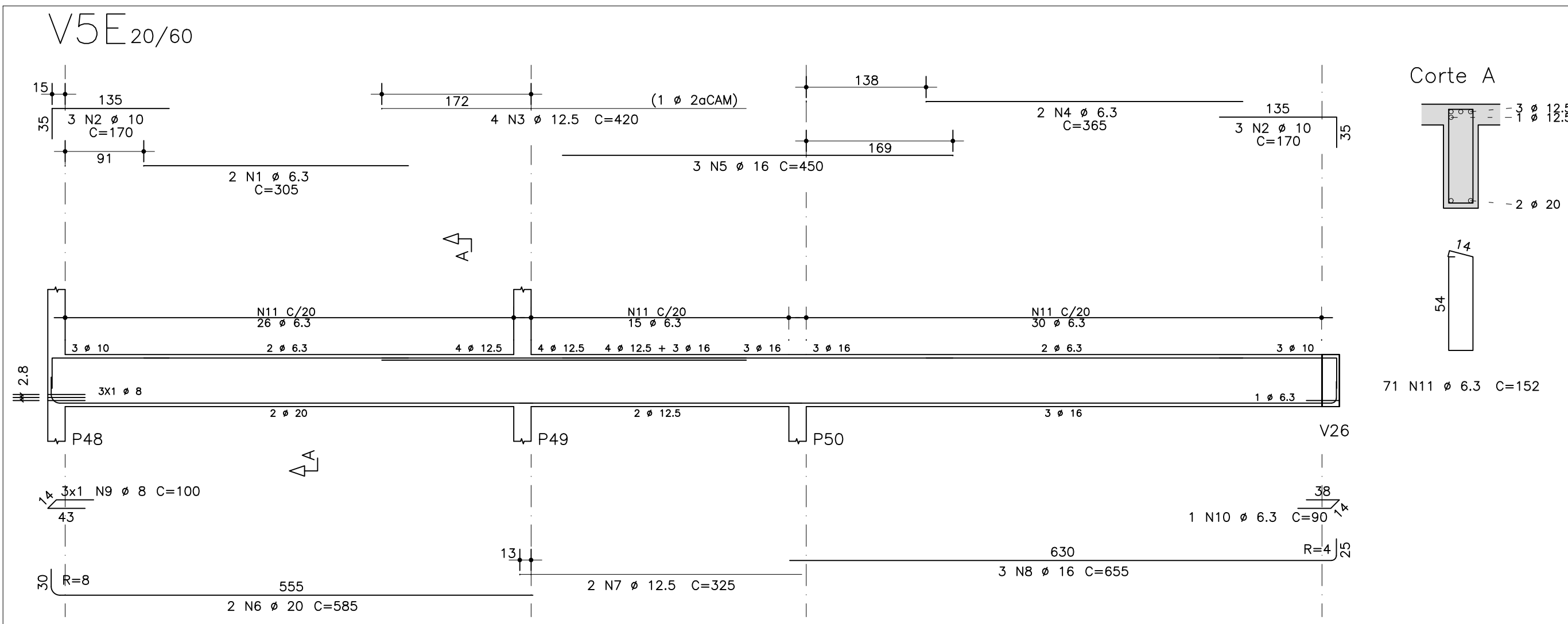
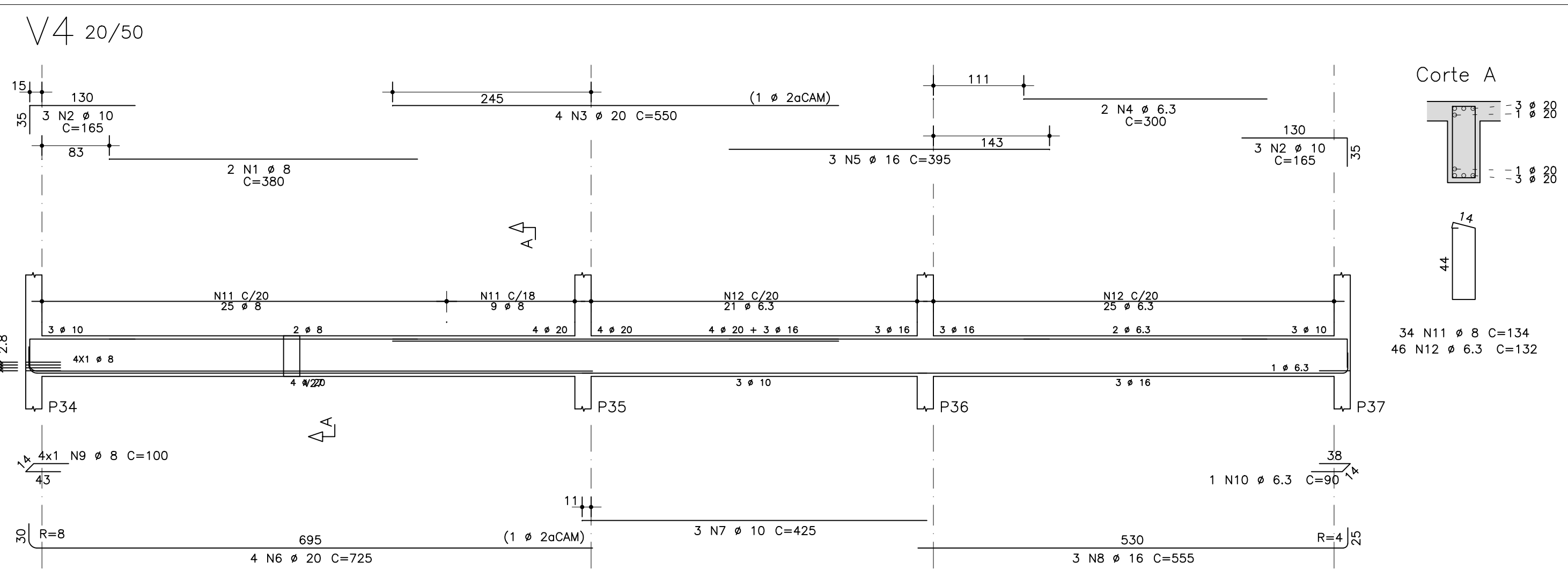
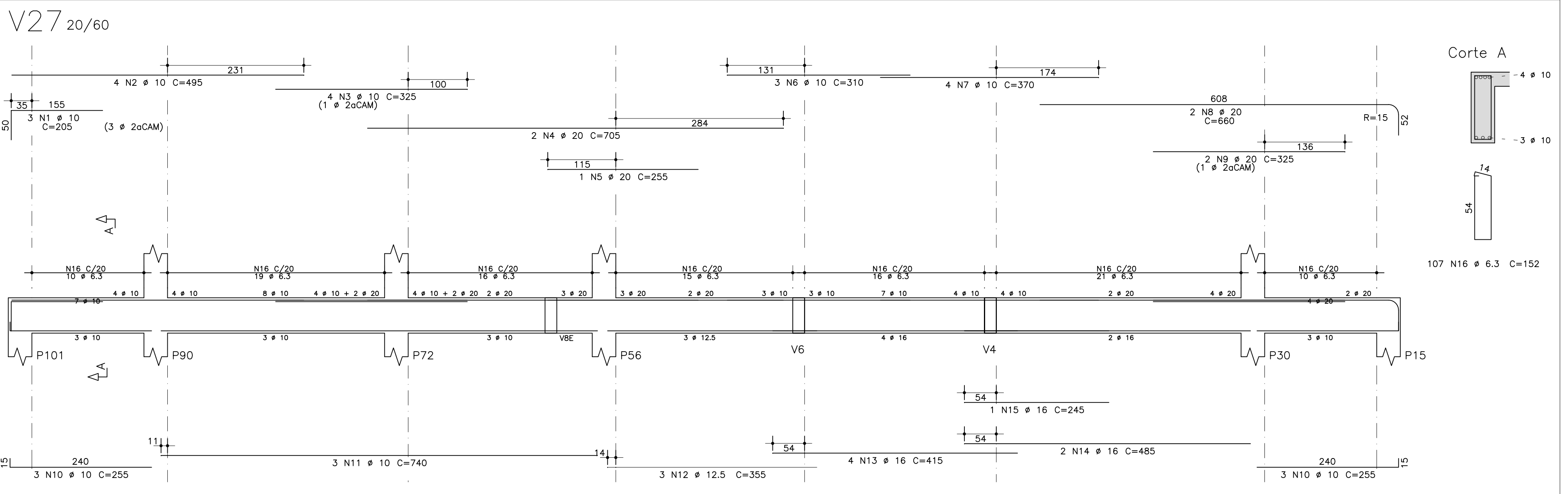
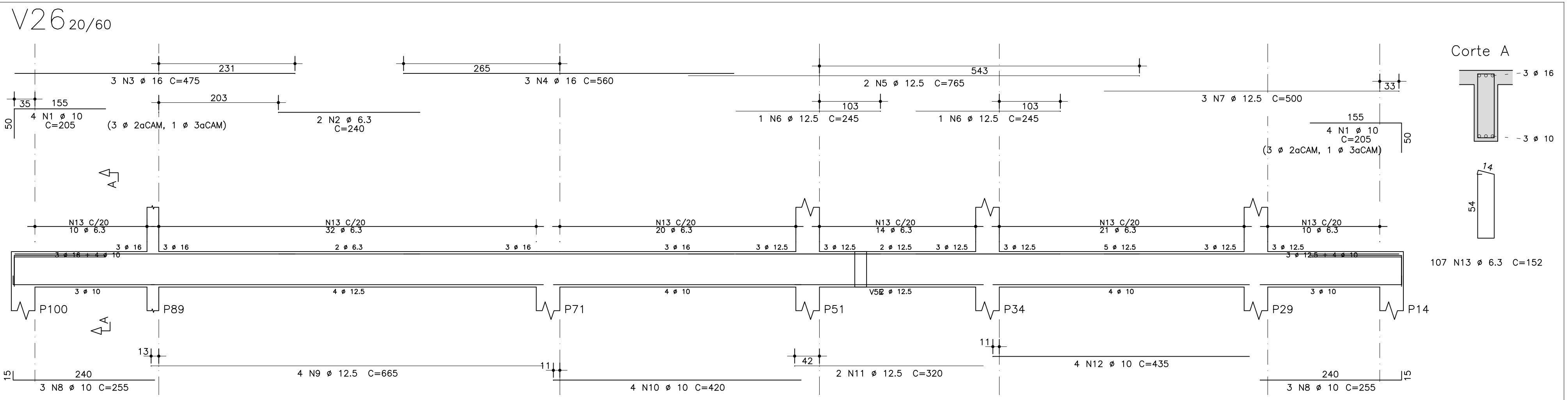
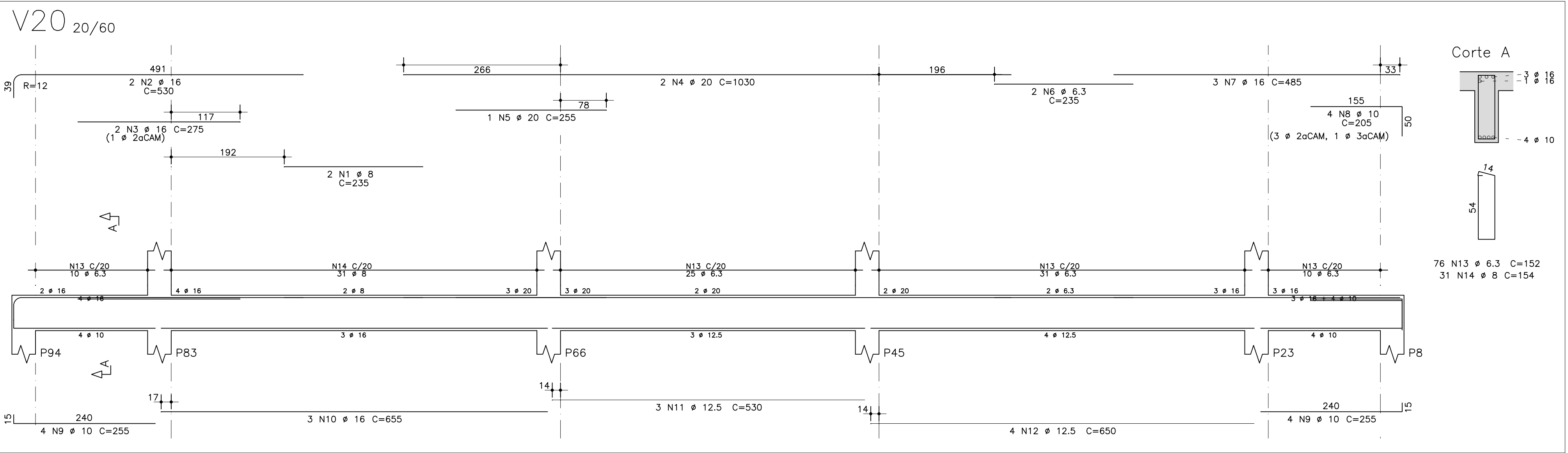
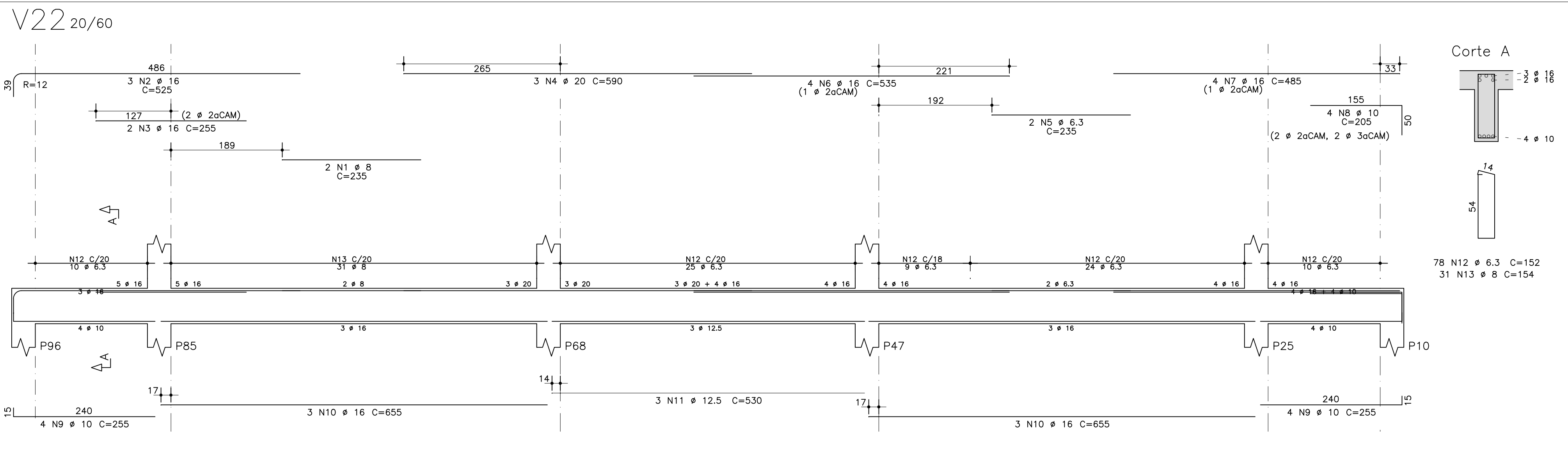
01

EST

04-14



	AÇO	POS	BIT	QUANT	COMPRIENTO	
					UNIT	TOTAL
			cm		cm	
V3E	SOA	1	6,3	2	305	610
	SOA	2	10	3	170	340
	SOA	3	12,5	4	655	2620
	SOA	4	6,3	2	270	540
	SOA	5	16	3	545	1635
	SOA	6	12,5	2	615	1230
	SOA	7	12,5	2	885	1770
	SOA	8	10	4	970	1940
	SOA	9	12,5	4	1250	2500
	SOA	10	10	4	325	1300
	SOA	11	6,3	86	152	10438
V6	SOA	1	6,3	2	375	750
	SOA	2	10	6	165	990
	SOA	3	20	3	555	1665
	SOA	4	6,3	2	300	600
	SOA	5	16	3	1185	3555
	SOA	6	16	4	715	2860
	SOA	7	10	3	425	1275
	SOA	8	16	16	655	10480
	SOA	9	6,3	3	425	1275
	SOA	10	6,3	79	132	10478
	SOA	11	6,3	96	152	14592
V8D	SOA	1	6,3	2	250	500
	SOA	2	10	6	170	1020
	SOA	3	16	3	485	1455
	SOA	4	12,5	2	485	970
	SOA	5	6,3	2	255	510
	SOA	6	16	4	640	2560
	SOA	7	16	3	570	1710
	SOA	8	10	4	970	1940
	SOA	9	12,5	2	1100	2200
	SOA	10	12,5	2	330	660
	SOA	11	12,5	2	455	910
V10D	SOA	1	6,3	4	255	1020
	SOA	2	10	6	170	1020
	SOA	3	12,5	9	1020	9180
	SOA	4	16	4	560	2240
	SOA	5	16	4	1710	6840
	SOA	6	10	4	365	1460
	SOA	7	12,5	1	330	330
	SOA	8	12,5	1	330	330
	SOA	9	12,5	2	455	910
	SOA	10	6,3	10	132	1320
	SOA	11	6,3	96	152	14592
V10E	SOA	1	6,3	2	305	610
	SOA	2	10	3	170	340
	SOA	3	12,5	4	655	2620
	SOA	4	6,3	2	270	540
	SOA	5	16	3	545	1635
	SOA	6	16	3	575	1725
	SOA	7	12,5	2	885	1770
	SOA	8	12,5	2	435	870
	SOA	9	10	4	970	1940
	SOA	10	6,3	10	132	1320
	SOA	11	6,3	86	152	10438
V19	SOA	1	6,3	2	175	350
	SOA	2	10	3	245	980
	SOA	3	12,5	3	680	1680
	SOA	4	12,5	2	565	1130
	SOA	5	12,5	1	255	255
	SOA	6	12,5	1	255	255
	SOA	7	12,5	1	525	525
	SOA	8	10	3	525	1575
	SOA	9	12,5	3	640	1920
	SOA	10	12,5	3	640	1920
	SOA	11	10	4	520	2080
V23	SOA	1	6,3	124	152	18848
	SOA	1	6,3	4	245	980
	SOA	2	12,5	6	905	3030
	SOA	3	12,5	3	1015	3045
	SOA	4	12,5	2	255	510
	SOA	5	12,5	2	255	510
	SOA	6	12,5	1	180	180
	SOA	7	10	3	180	540
	SOA	8	12,5	3	650	1950
	SOA	9	10	4	520	2080
	SOA	10	10	4	520	2080
V24	SOA	1	8	2	235	470
	SOA	2	16	2	470	940
	SOA	3	20	1	255	255
	SOA	4	16	4	640	2560
	SOA	5	16	4	575	1100
	SOA	6	6,3	2	235	470
	SOA	7	10	3	530	2120
	SOA	8	10	6	255	1530
	SOA	9	16	3	655	1965
	SOA	10	10	4	520	2080
	SOA	11	6,3	124	152	18848
V25	SOA	1	10	2	205	1435
	SOA	2	12,5	3	330	990
	SOA	3	16	16	1040	16640
	SOA	4	16	2	285	570
	SOA	5	20	1	570	570
	SOA	6	12,5	4	590	2360
	SOA	7	10	3	625	1875
	SOA	8	12,5	2	665	1330
	SOA	9	12,5	2	665	1330
	SOA	10	12,5	2	555	1110
	SOA	11	12,5	2	555	1110
V33	SOA	1	10	3	325	975
	SOA	2	10	3	325	975
	SOA	3	10	4	205	820
	SOA	4	10	3	170	510
	SOA	5	10	3	350	1050
	SOA	6	10	3	350	1050
	SOA	7	10	3	335	1005
	SOA	8	10	3	285	855
	SOA	9	10	3	565	1695
	SOA	10	10	3	565	1695
	SOA	11	6,3	93	132	12276



AÇO	POS	BIT	QUANT	COMPRIMENTO	UNIT	TOTAL
		mm		cm		
V2	SOA	1	6.3	2	385	770
	SOA	2	12.5	3	490	1470
	SOA	3	10	2	475	950
	SOA	4	6.3	2	260	520
	SOA	5	12.5	3	550	1650
	SOA	6	10	3	185	555
	SOA	7	10	2	920	1840
	SOA	8	10	2	445	890
	SOA	9	10	2	185	370
	SOA	10	10	2	1090	2180
	SOA	11	10	2	370	740
	SOA	12	10	2	430	860
	SOA	13	6.3	96	152	14592

V3D	SOA	1	6.3	4	255	1020
	SOA	3	12.5	2	630	1260
	SOA	4	12.5	2	270	540
	SOA	5	12.5	2	240	480
	SOA	6	16	4	560	2240
	SOA	8	12.5	2	1100	2200
	SOA	9	10	4	365	1460
	SOA	10	12.5	1	870	870
	SOA	11	12.5	2	435	870
	SOA	12	6.3	96	152	14592

V4	SOA	1	8	2	380	760
	SOA	2	10	6	165	990
	SOA	3	20	4	550	2200
	SOA	4	6.3	2	300	600
	SOA	5	16	3	395	1580
	SOA	6	20	4	725	2900
	SOA	8	16	3	425	1700
	SOA	9	10	4	100	400
	SOA	10	6.3	1	90	90
	SOA	11	8	34	134	4556
	SOA	12	6.3	46	132	6072

V5D	SOA	1	6.3	6	250	1500
	SOA	2	10	6	170	1020
	SOA	3	12.5	4	495	1980
	SOA	4	6.3	2	255	510
	SOA	5	16	3	560	2240
	SOA	6	16	3	570	2280
	SOA	7	18	3	1460	5880
	SOA	8	12.5	2	1100	2200
	SOA	9	12.5	2	435	870
	SOA	10	12.5	2	455	910
	SOA	11	6.3	96	152	14592

V5E	SOA	1	6.3	2	365	730
	SOA	2	12.5	3	490	1470
	SOA	3	10	4	475	1900
	SOA	4	6.3	2	260	520
	SOA	5	12.5	3	550	1650
	SOA	6	16	3	185	555
	SOA	7	16	3	920	1840
	SOA	8	10	2	450	900
	SOA	9	10	2	185	370
	SOA	10	10	2	1090	2180
	SOA	11	10	2	365	730
	SOA	12	10	2	430	860
	SOA	13	6.3	96	152	14592

V11	SOA	1	6.3	2	385	770
	SOA	2	12.5	3	490	1470
	SOA	3	10	4	475	1900
	SOA	4	6.3	2	260	520
	SOA	5	12.5	3	550	1650
	SOA	6	10	3	185	555
	SOA	7	10	2	920	1840
	SOA	8	10	2	450	900
	SOA	9	10	2	185	370
	SOA	10	10	2	1090	2180
	SOA	11	10	2	365	730
	SOA	12	10	2	430	860
	SOA	13	6.3	96	152	14592

V20	SOA	1	8	2	235	470
	SOA	2	10	6	170	1020
	SOA	3	16	2	275	550
	SOA	4	20	2	1030	2060
	SOA	5	20	1	255	255
	SOA	6	6.3	2	235	470
	SOA	7	18	3	485	1455
	SOA	8	10	4	205	820
	SOA	9	10	3	255	765
	SOA	10	12.5	3	655	1965
	SOA	11	12.5	3	530	1590
	SOA	12	12.5	4	76	304
	SOA	13	6.3	31	152	11552

V22	SOA	1	8	2	235	470
	SOA	2	16	3	525	1575
	SOA	3	18	3	475	1425
	SOA	4	20	3	590	1770
	SOA	5	20	1	255	255
	SOA	6	6.3	2	435	870
	SOA	7	16	4	485	1940
	SOA	8	10	4	205	820
	SOA	9	10	8	255	2040
	SOA	10	16	6	655	3930
	SOA	11	12.5	3	530	1590
	SOA	12	6.3	78	152	11856
	SOA	13	8	31	154	4774

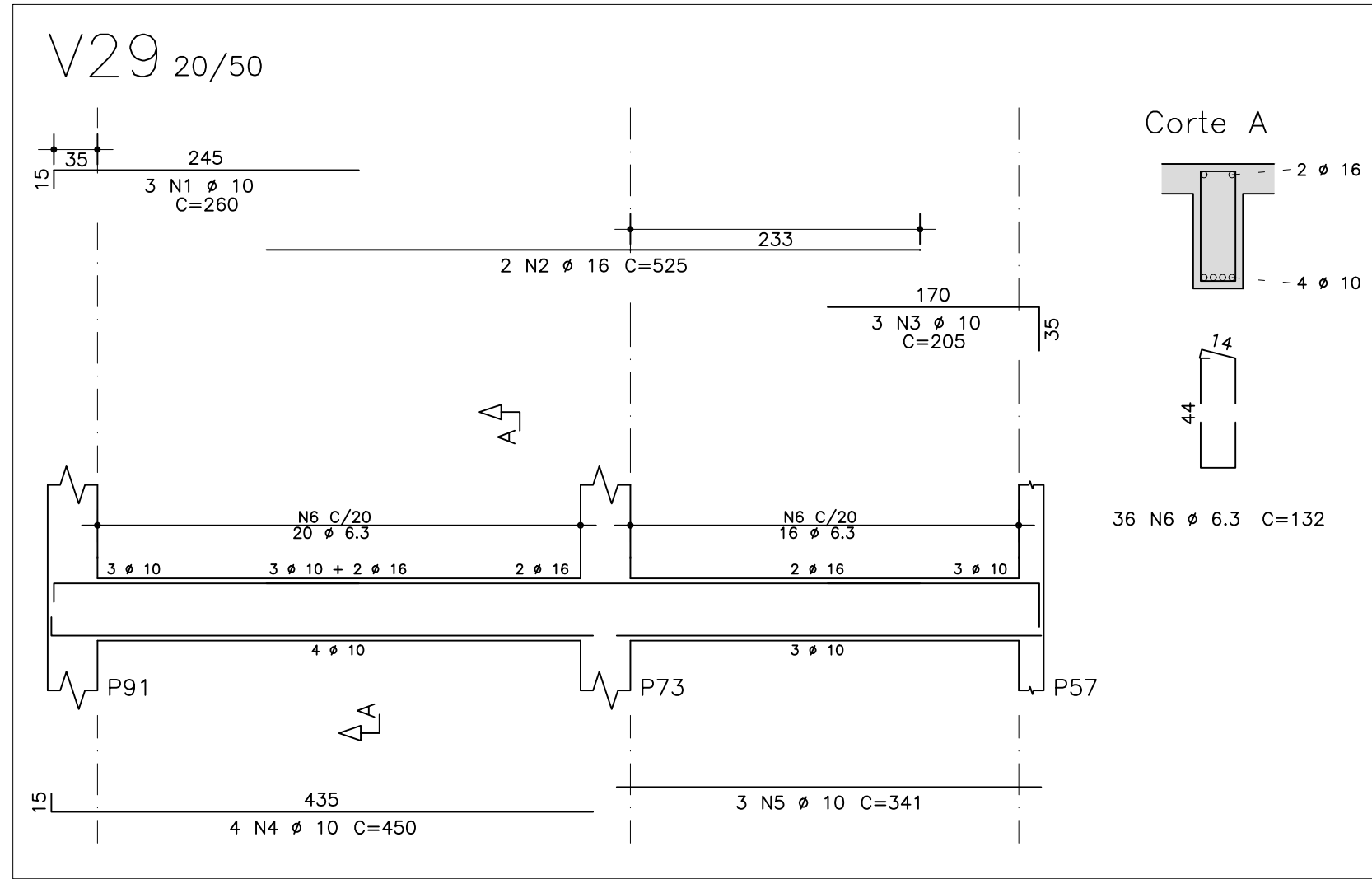
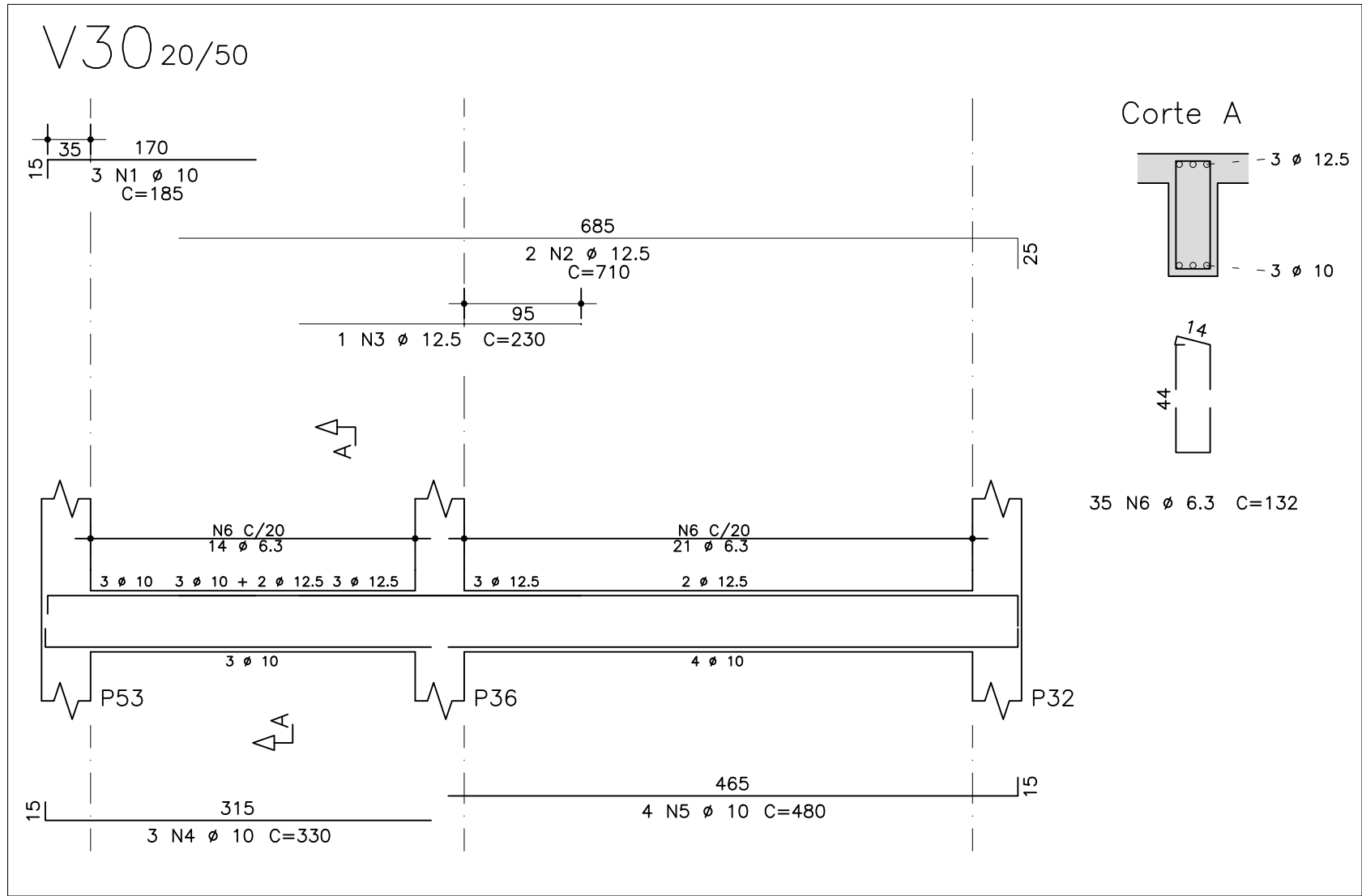
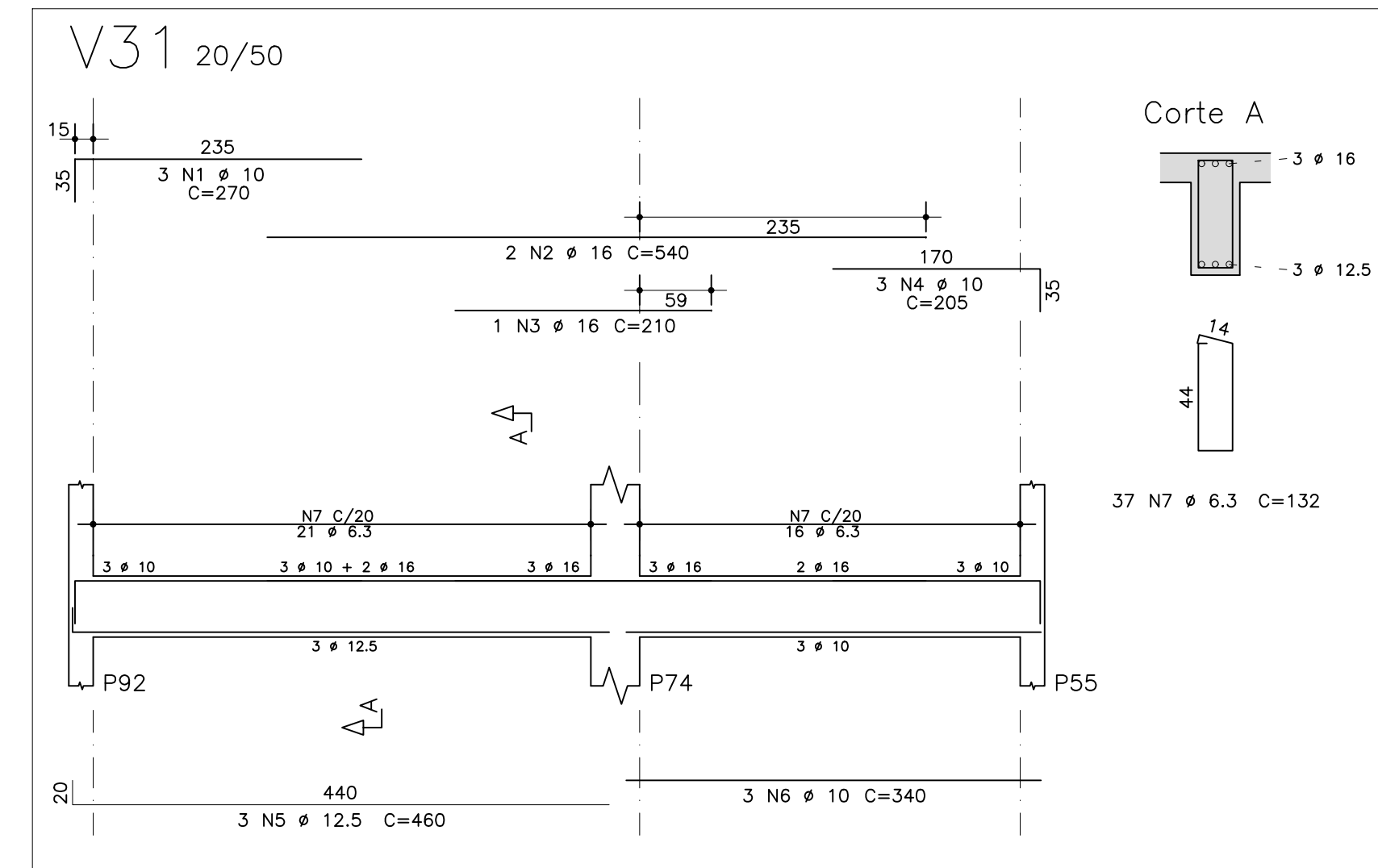
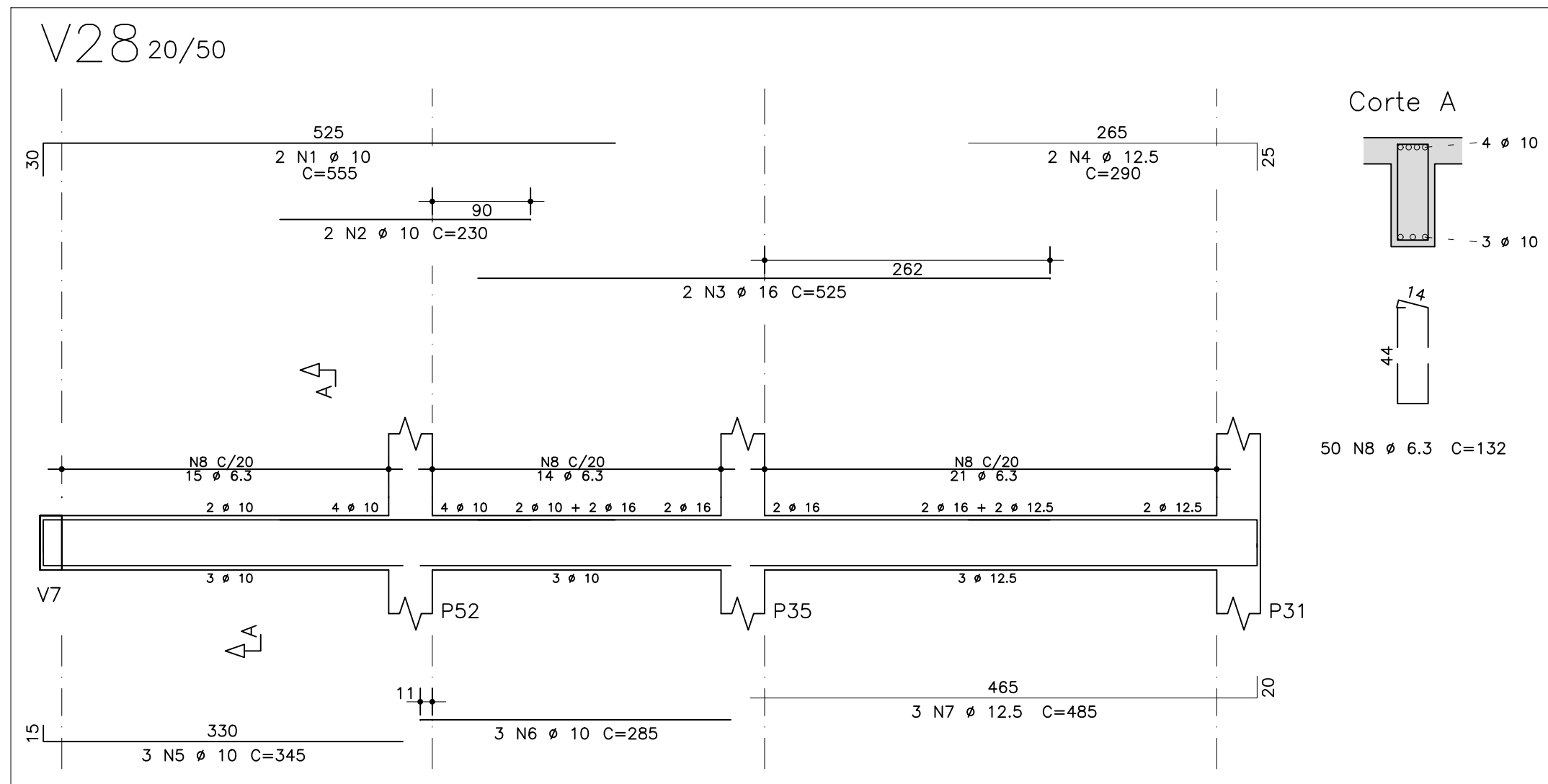
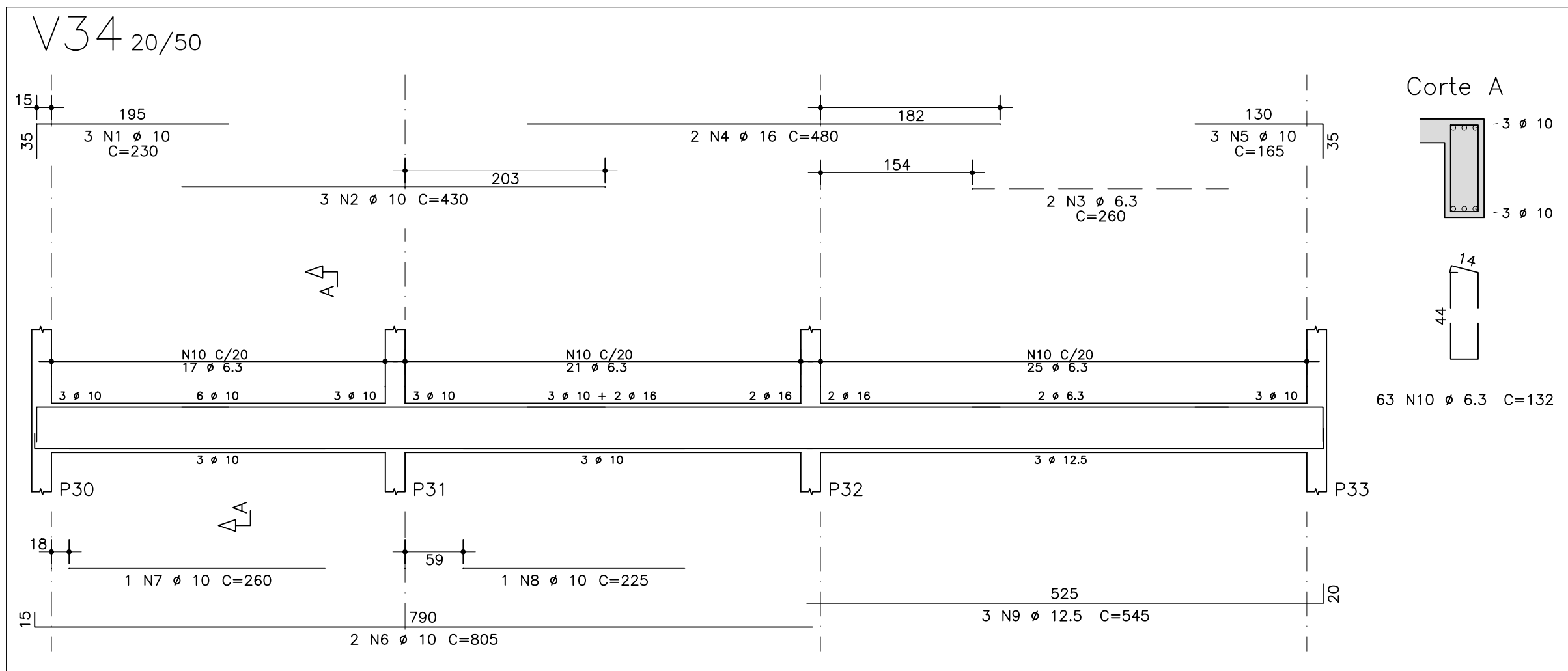
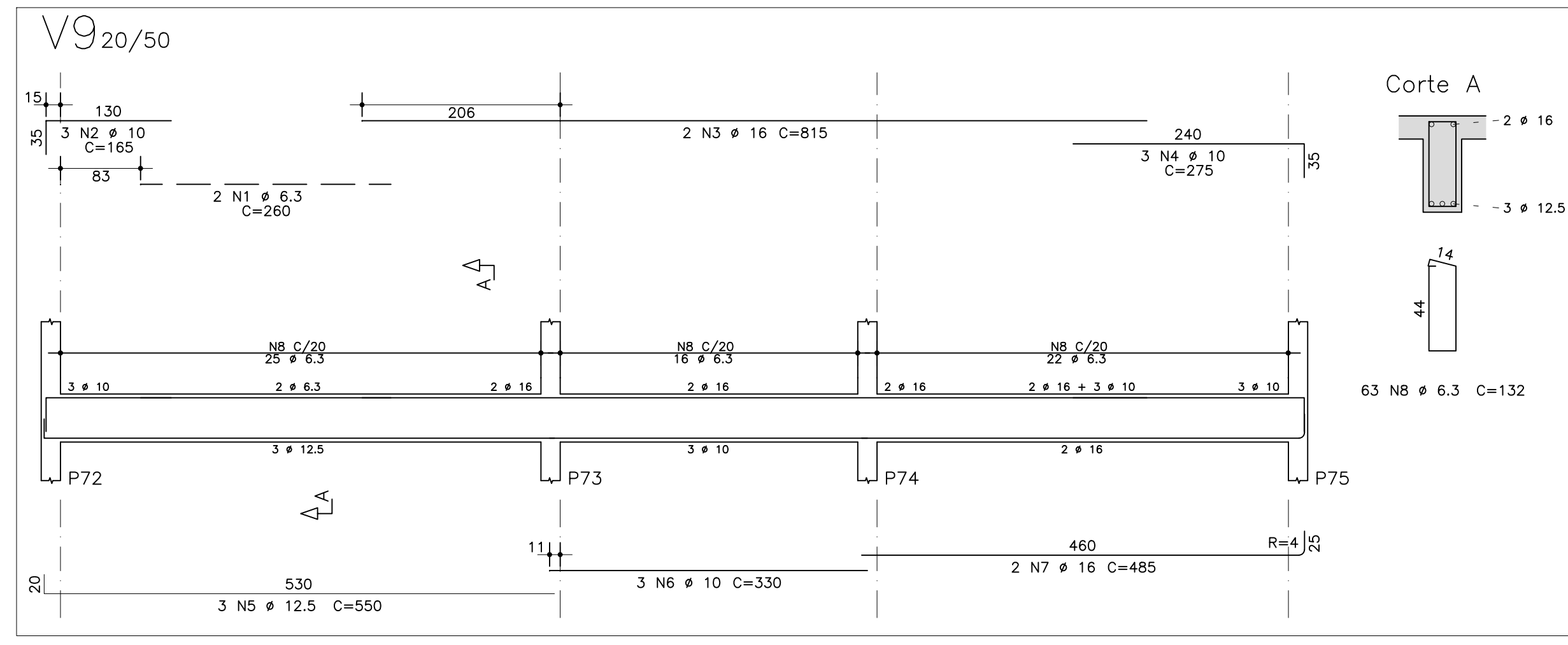
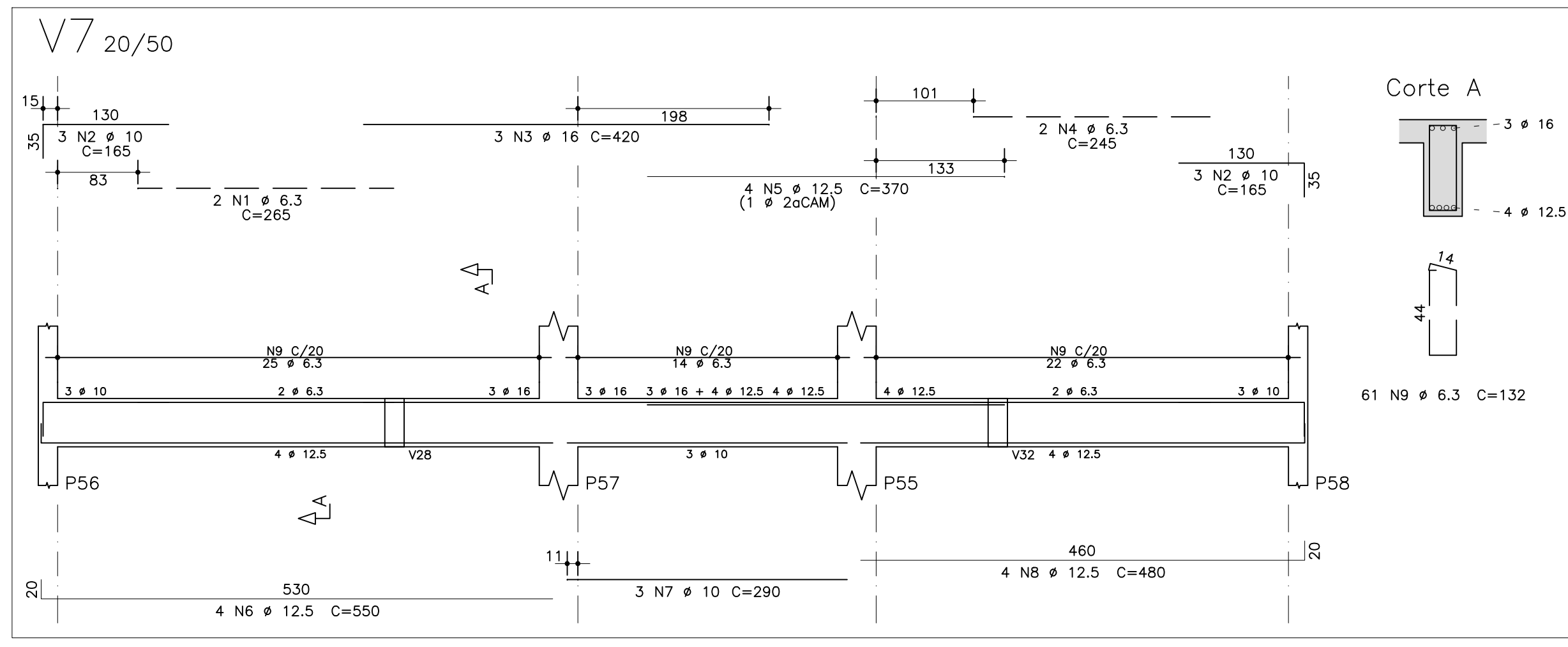
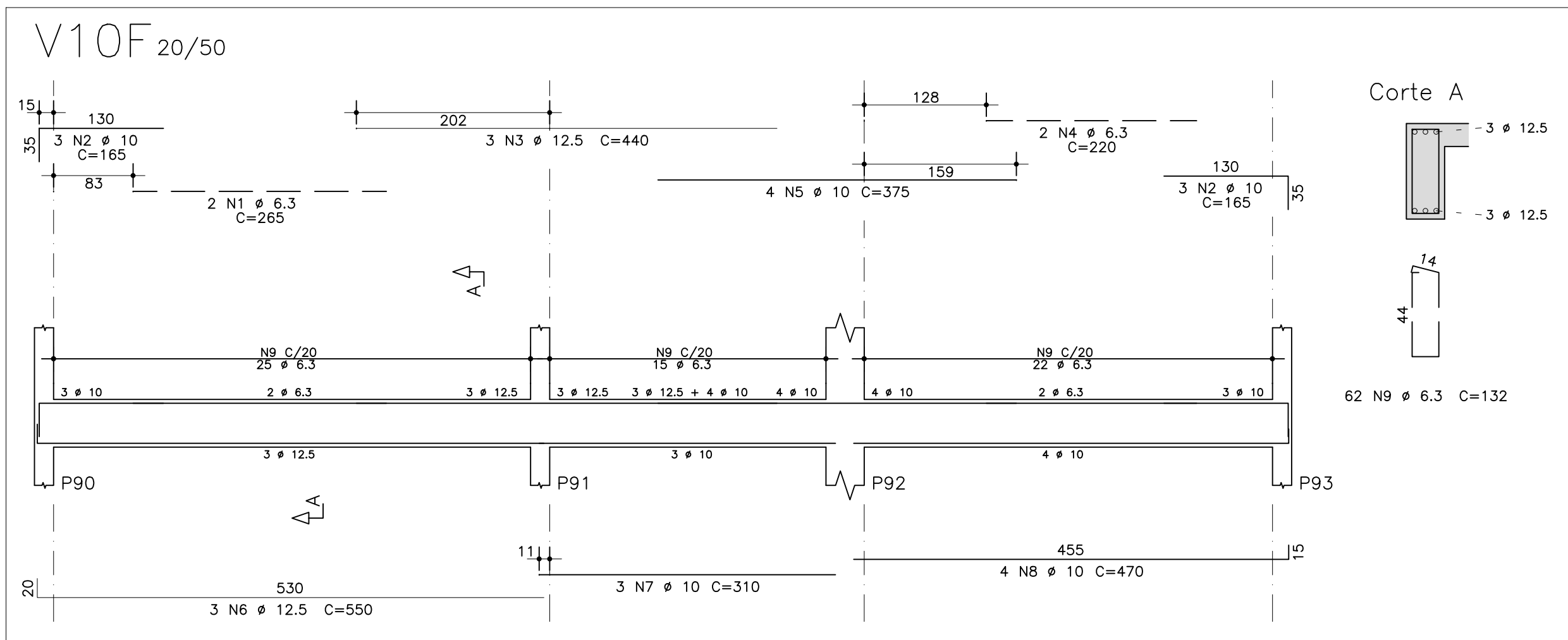
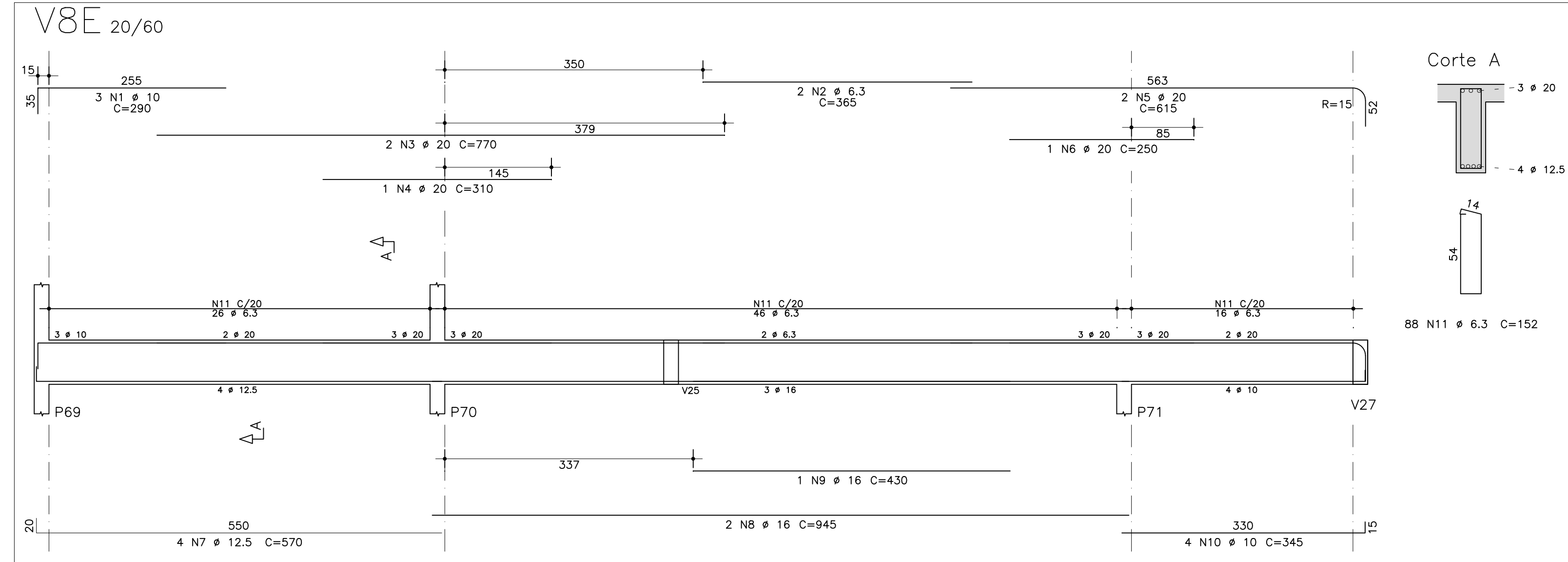
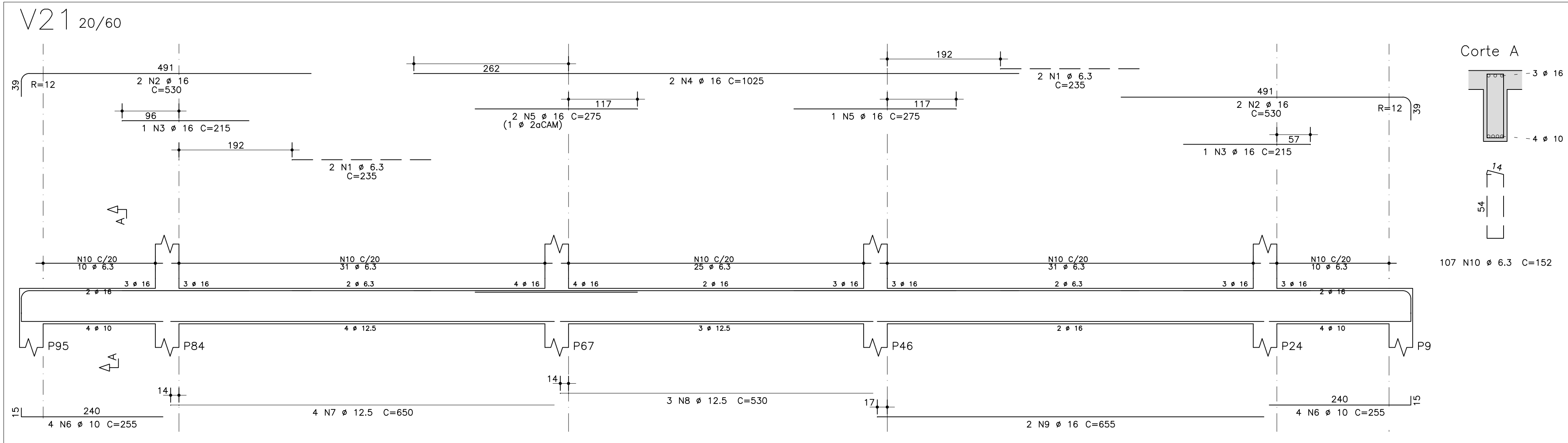
V26	SOA	1	10	8	205	1640
	SOA	2	6.3	2	240	480
	SOA	3	18	3	475	1425
	SOA	4	16	3	560	1680
	SOA	5	12.5	2	765	1530
	SOA	6	12.5	2	245	490
	SOA	7	12.5	3	500	1500
	SOA	8	10	6	255	1530
	SOA	9	12.5	4	665	2660
	SOA	10	10	4	420	1680
	SOA	11	12.5	2	320	640
	SOA	12	10	4	435	1740
	SOA	13	6.3	107	152	16264

V27	SOA	1	10	3	205	615
	SOA	2	10	3	525	1575
	SOA	3	10	4	325	1300
	SOA	4	20	2	705	1410
	SOA	5	20	1	255	255
	SOA	6	10	3	310	930
	SOA	7	10	3	370	1110
	SOA	8	20	2	660	1320
	SOA	9	20	2	325	650
	SOA	10	10	6	255	1530
	SOA	11	10	3	740	2220
	SOA	12	12.5	3	355	1065
	SOA	13	16	4	415	1660
	SOA	14	16	2	485	970
	SOA	15	16	2	245	245
	SOA	16	6.3	107	152	16264

V32	SOA	1	6.3	2	255	510
	SOA	2	10	3	165	495
	SOA	3	10	4	360	1440
	SOA	4	6.3	15	132	1980

RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
		m	kgf
SOA	1	1420	148
SOA	2	165	65
SOA	3	508	314
SOA	4	359	348
SOA	5	16	345
SOA	6	140	345
Peso Total	SOA	=	1969 kgf

VIGAMENTO DO TÉRREO 02/03
(ESCALA 1:50)

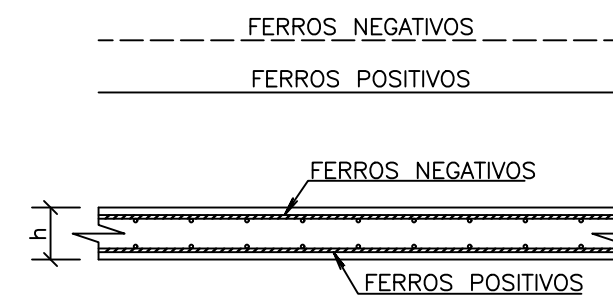


AÇO	POS	BIT	QUANT	COMPRIMENTO	
				UNIT	TOTAL
				cm	cm
V7					
50A	1	6.3	2	265	530
50A	2	10	2	165	330
50A	3	16	3	420	1260
50A	4	16	2	245	490
50A	5	12.5	4	370	1480
50A	6	12.5	2	580	1160
50A	7	10	3	290	870
50A	8	12.5	4	480	1920
50A	9	6.3	61	132	8052
V8E					
50A	1	10	3	290	870
50A	2	6.3	2	365	730
50A	3	20	2	770	1540
50A	4	20	1	310	310
50A	5	20	2	615	1230
50A	6	20	1	250	250
50A	7	12.5	4	570	2280
50A	8	16	2	945	1890
50A	9	16	1	430	430
50A	10	10	4	345	1380
50A	11	6.3	88	152	13376
V9					
50A	1	6.3	2	260	520
50A	2	10	3	165	495
50A	3	16	2	815	1630
50A	4	10	3	775	1550
50A	5	12.5	3	550	1650
50A	6	10	3	330	990
50A	7	16	2	485	970
50A	8	6.3	63	132	8316
V10F					
50A	1	6.3	2	265	530
50A	2	10	2	165	330
50A	3	12.5	3	440	1320
50A	4	6.3	4	220	880
50A	5	10	3	550	1650
50A	6	12.5	3	310	930
50A	7	10	4	470	1880
50A	8	10	4	814	3256
V21					
50A	1	6.3	4	230	920
50A	2	16	4	530	2120
50A	3	16	2	215	430
50A	4	16	2	1025	2050
50A	5	16	3	275	825
50A	6	10	4	450	1800
50A	7	12.5	4	650	2600
50A	8	12.5	3	310	930
50A	9	16	2	655	1310
50A	10	6.3	107	152	16264
V28					
50A	1	10	2	555	1110
50A	2	16	2	65	130
50A	3	16	2	525	1050
50A	4	12.5	2	290	580
50A	5	10	3	345	1035
50A	6	10	3	285	855
50A	7	12.5	3	485	1455
50A	8	6.3	50	132	6600
V29					
50A	1	10	3	260	780
50A	2	16	2	535	1070
50A	3	10	3	205	615
50A	4	10	4	450	1800
50A	5	10	3	341	1023
50A	6	6.3	36	132	4752
V30					
50A	1	10	3	185	555
50A	2	12.5	2	710	1420
50A	3	10	1	230	230
50A	4	10	3	330	990
50A	5	10	4	480	1920
50A	6	6.3	35	132	4620
V31					
50A	1	10	3	270	810
50A	2	16	2	540	1080
50A	3	16	1	210	210
50A	4	10	3	205	615
50A	5	12.5	3	460	1380
50A	6	10	3	340	1020
50A	7	6.3	37	132	4884
V34					
50A	1	10	3	230	690
50A	2	10	3	430	1290
50A	3	6.3	3	250	750
50A	4	16	2	480	960
50A	5	10	2	805	1610
50A	6	10	1	260	260
50A	7	10	1	225	225
50A	8	12.5	3	545	1635
50A	9	10	3	330	990
50A	10	6.3	63	132	8316

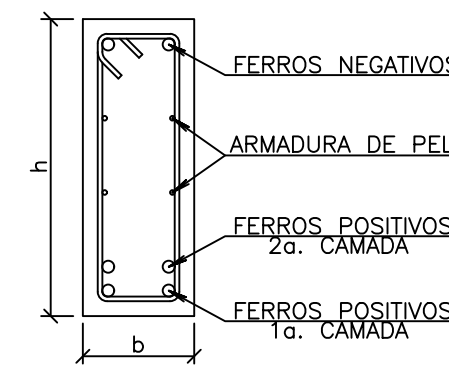
RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
	mm	m	kgf
50A	6.3	881	216
50A	10	319	197
50A	12.5	234	187
50A	16	173	272
50A	20	125	82
Peso Total 50A =			992 kgf

LEGENDA

CONVENÇÃO ARMADURA PARA LAJES:



h--> espessura da laje
c--> cobrimento das armaduras



NOTA:

- 1 - COTAS E DIMENSÕES EM CM.
- 2 - CONFIRMAR MEDIDAS NO LOCAL.
- 3 - AS COTAS PREVALECEM SOBRE O DESENHO.
- 4 - CONCRETO:

4.1 - PROPRIEDADES EXIGIDAS

PROPRIEDADE	VALORES			UNIDADE
	LAJES	VIGAS	PILOARES E PAREDES	
Resistência característica (Fck)	30	30	30	MPa
Consumo mínimo de cimento	300	300	300	Kg/m³
Fator água-cimento	0.50	0.50	0.50	-

5 - AÇOS:

CA-50: Fyk = 500 MPa
CA-60: Fyk = 600 MPa

6 - COBRIMENTO DAS ARMADURAS:

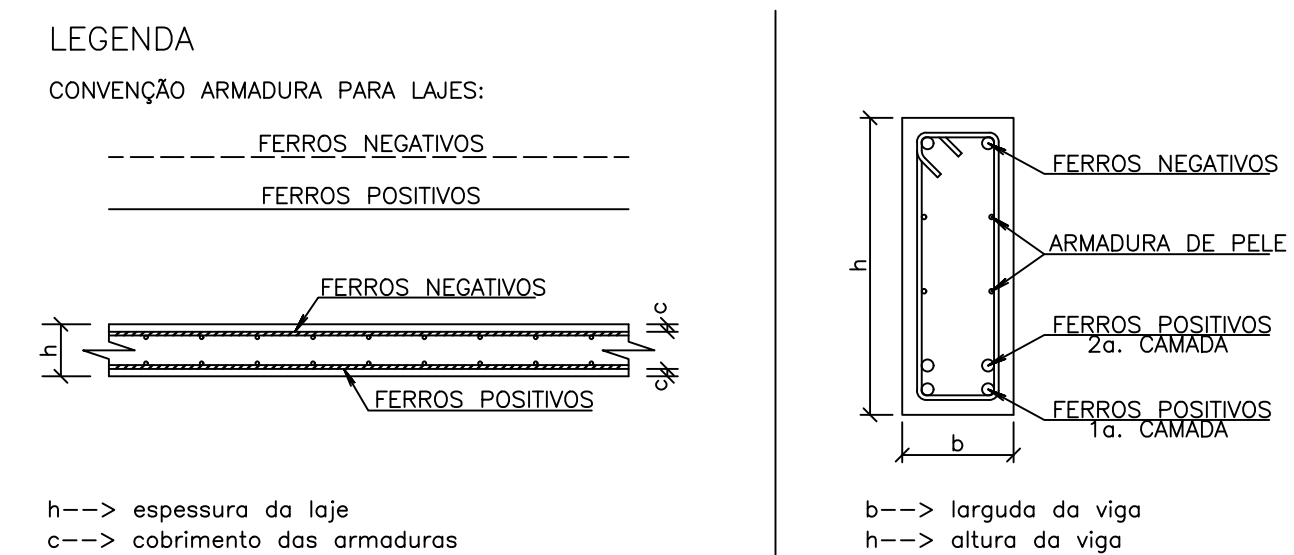
Pilares: 3.0 cm
Lajes: 2.5 cm
Vigas: 3.0 cm
Sapatas: 5.0 cm
Tolerância para o cobrimento: 0.5 cm

DOBRAMENTO DAS BARRAS

SEM ESCALA

DIÂMETROS DE DOBRAMENTOS			
#	CA-50	CA-60	
Ø	Ø	Ø	
< 20	5d	6d	
> 20	6d	7d	
EMENDAS			
BITOLA	Ø	Ø	TRANSPASSE
< 20	5d	6d	50.0
> 20	6d	7d	60.0
> 20	6d	7d	80.0
> 20	6d	7d	100.0
> 20	6d	7d	120.0
> 20	6d	7d	140.0
> 20	6d	7d	160.0
> 20	6d	7d	180.0
> 20	6d	7d	200.0

		PREFEITURA MUNICIPAL DE IRUPI	
		CONSULTORIA AVANTEC SOLUÇÕES EM ENGENHARIA	
PROJETO EXECUTIVO DE ENGENHARIA E ARQUITETURA			
TÍTULO: PROJETO ESTRUTURAL ESCOLA POLO - ETAPA 01			
LOCAL: CORREIO BARRA GRANDE - IRUPI			
COORDENADOR:	ELABORADO:	REVISADO:	APROVADO:
AUTOR DO PROJETO:	ELABORADO:	REVISADO:	APROVADO:
EQUIPE TÉCNICA RESPONSÁVEL PELO PROJETO		EQUIPE TÉCNICA RESPONSÁVEL PELO PROJETO	



RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
	mm	m	kgf
50A	6.3	7979	1955
Peso Total	50A =		1955 kgf

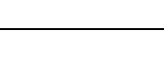
ELEMENTOS ESTRUTURAIS EM GERAL				
PROPRIEDADE	VALORES			UNIDADE
	LAJES	VIGAS	PILARES E PAREDES	
Resistência característica (Fck)	30 *	30	30 *	MPa
Consumo mínimo de cimento	300	300	300	Kg/m ³
Fator água-cimento	0.50	0.50	0.50	—

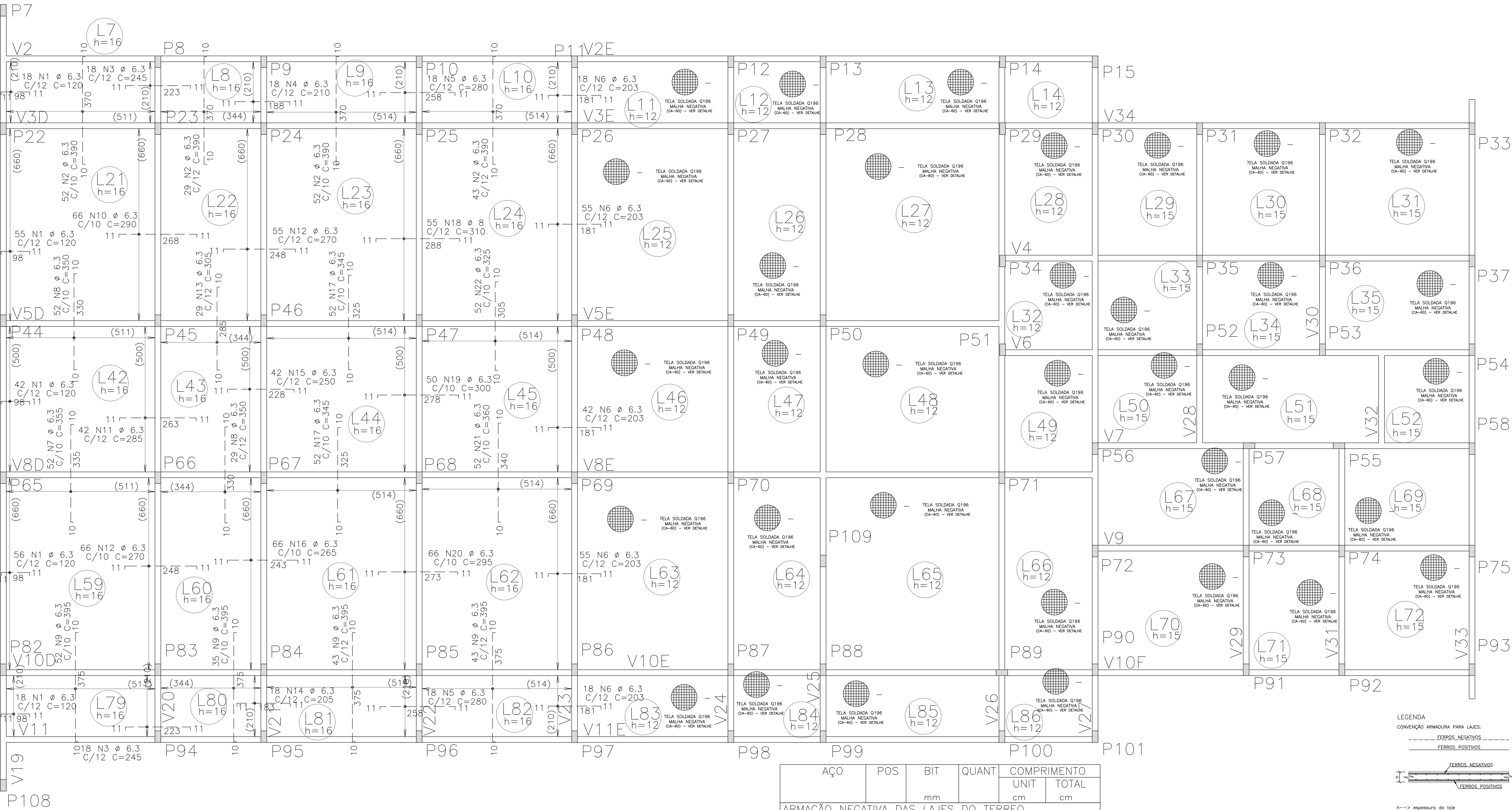
6 - COBRIMENTO DAS ARMADURAS:

Pilares:	3.0 cm
Lajes:	2.5 cm
Vigas:	3.0 cm
Sapatas:	5.0 cm

Tolerância para o cobrimento:

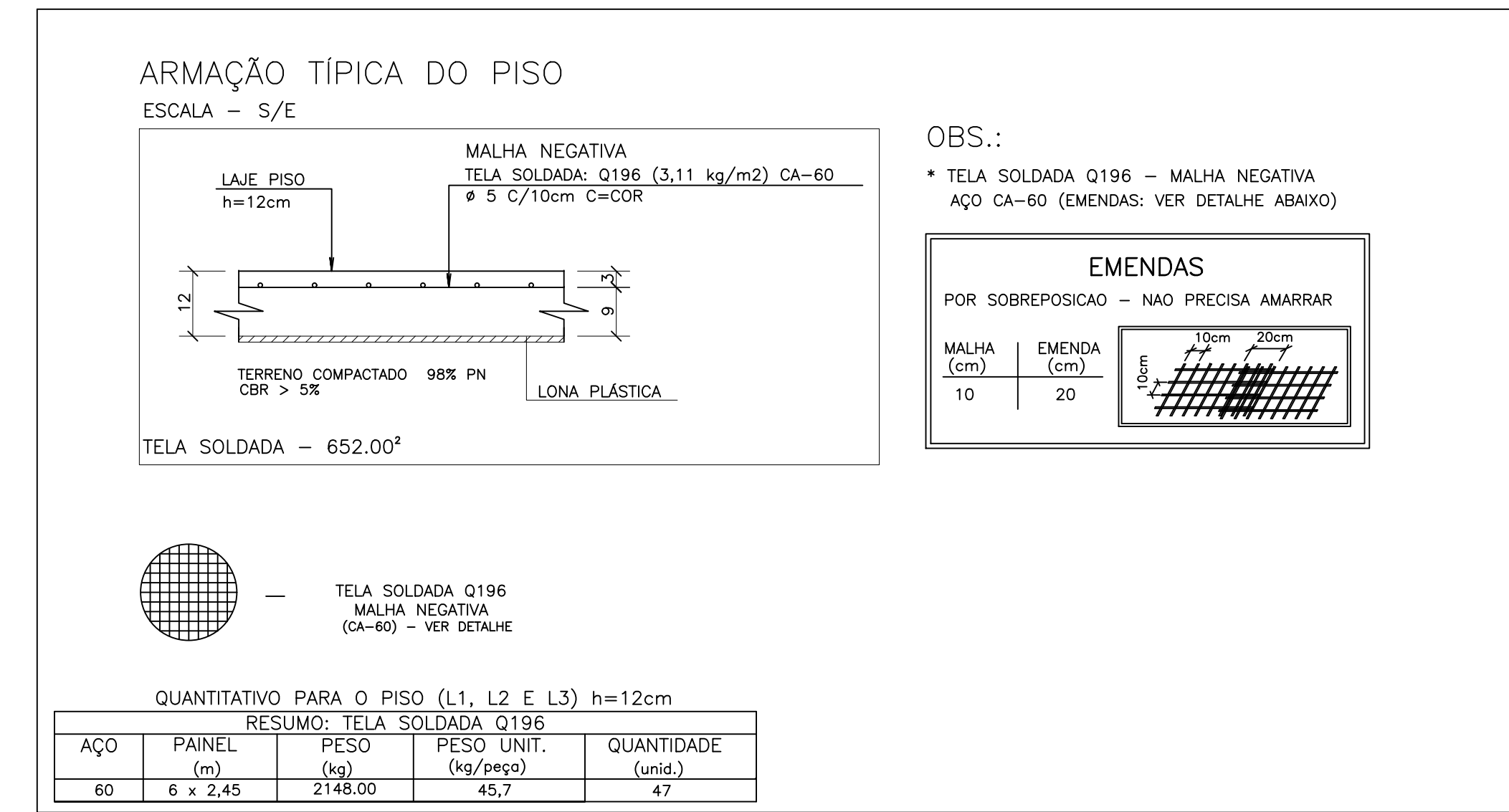
DIÂMETROS DE DOBRAMENTOS				
#	CA-50	CA-60		
< 20	5A	6A		
> 20	5B	—		

EMENDAS		
BITOLA (ø)	TRANSPASSE (L)	
5,0	50,0	
6,3	50,0	
8,0	80,0	
10,0	80,0	
12,5	100,0	
16,0	120,0	
20,0	160,0	
25,0	200,0	



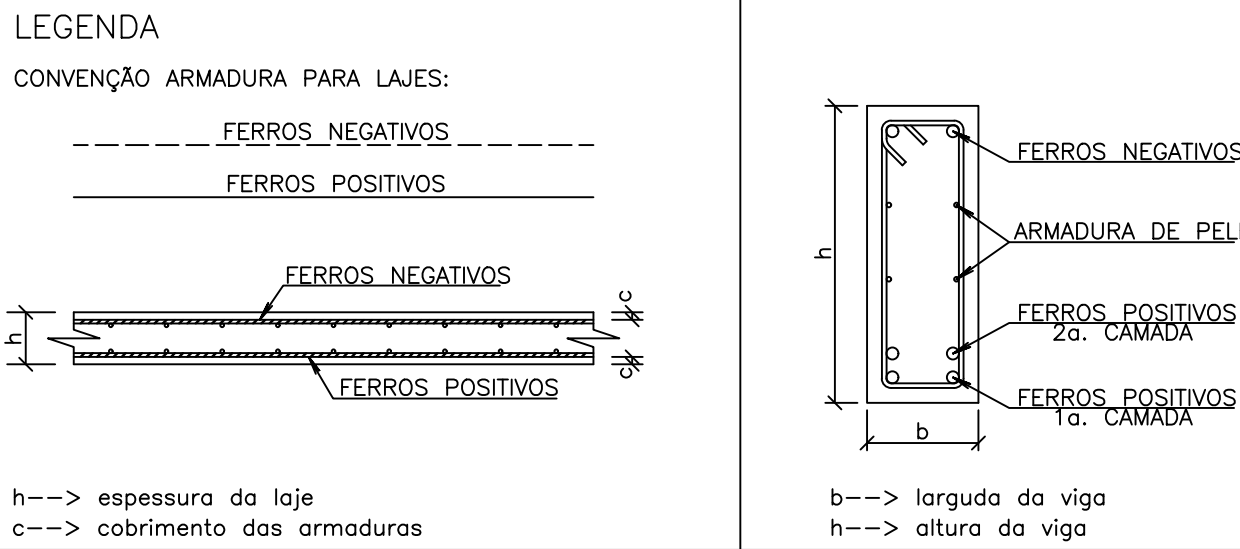
ARMAÇÃO NEGATIVA DAS LAJES DO TERREO

(ESCALA 1:100)



AÇO		POS	BIT	QUANT	COMPRIMENTO	
			mm		UNIT	TOTAL
					cm	cm
ARMAÇÃO NEGATIVA DAS LAJES DO TERREO						
50A	1	6.3	189	120	22680	
50A	2	6.3	176	390	68640	
50A	3	6.3	36	245	8820	
50A	4	6.3	18	210	3780	
50A	5	6.3	36	280	10080	
50A	6	6.3	188	203	38164	
50A	7	6.3	52	355	18460	
50A	8	6.3	81	350	28350	
50A	9	6.3	173	395	68335	
50A	10	6.3	66	290	19140	
50A	11	6.3	42	285	11970	
50A	12	6.3	121	270	32670	
50A	13	6.3	29	305	8845	
50A	14	6.3	18	205	3690	
50A	15	6.3	42	250	10500	
50A	16	6.3	66	265	17490	
50A	17	6.3	104	345	35880	
50A	18	8	55	310	17050	
50A	19	6.3	50	300	15000	
50A	20	6.3	66	295	19470	
50A	21	6.3	52	360	18720	
50A	22	6.3	52	325	16900	

RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
50A	mm	m	kgf
50A	6.3	4776	1170
50A	8	171	67
Peso Total		50A =	1237 kgf



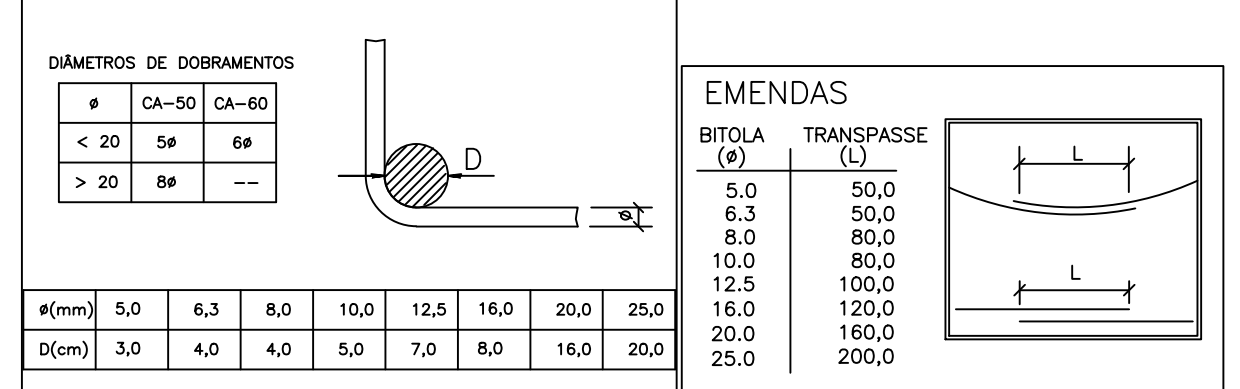
NOTA:
1 - COTAS E DIMENSÕES EM CM.
2 - CONFIRMAR MEDIDAS NO LOCAL.
3 - AS COTAS PREVALECEM SOBRE O DESENHO.
4 - CONCRETO:

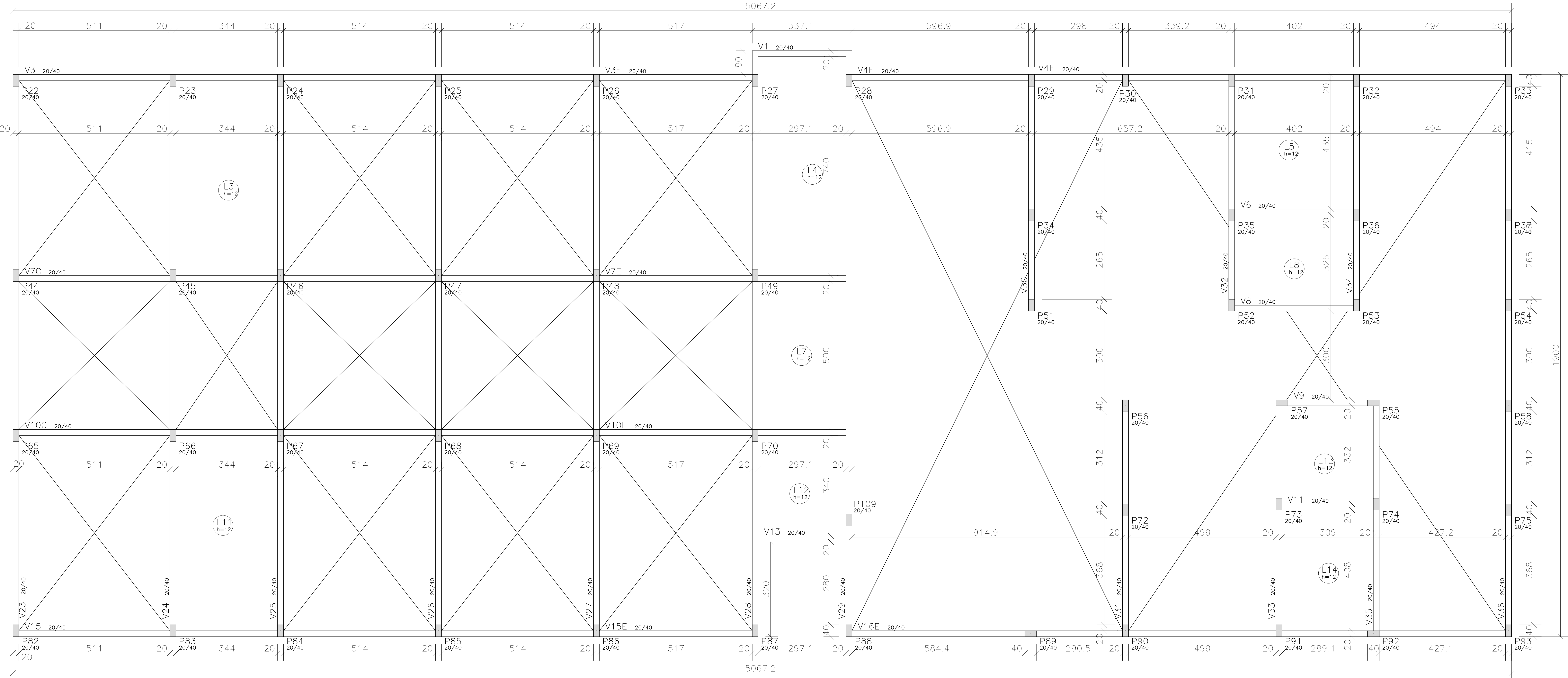
ELEMENTOS ESTRUTURAIS EM GERAL				
PROPRIEDADE	VALORES			UNIDADE
	LAJES	VIGAS	PILARES E PAREDES	
Resistência característica (Fck)	30	30	30	MPa
Consumo mínimo de cimento	300	300	300	kg/m³
Fator água-cimento	0.50	0.50	0.50	-

5 - AÇOS:
CA-50: Fyk = 500 MPa
CA-60: Fyk = 600 MPa

6 - COBRIMENTO DAS ARMADURAS:
Lajes: 3.0 cm
Vigas: 2.5 cm
Pilares: 3.0 cm
Sopistas: 5.0 cm
Tolerância para o cobrimento: 0.5 cm

DOBRAMENTO DAS BARRAS SEM ESCALA





FORMAS DA COBERTURA – ETAPA 1
(ESCALA 1:100)

LEGENDA

CONVENÇÃO ARMADURA PARA LAJES:

----- FERROS NEGATIVOS

----- FERROS POSITIVOS

h--> espessura da laje

c--> cobrimento das armaduras

h--> altura da viga

b--> largura da viga

NOTA:

1 – COTAS E DIMENSÕES EM CM.

2 – CONFIRMAR MEDIDAS NO LOCAL.

3 – AS COTAS PREVALECEM SOBRE O DESENHO.

4 – CONCRETO:

4.1 – PROPRIEDADES EXIGIDAS

ELEMENTOS ESTRUTURAS EM GERAL				
PROPRIEDADE	VALORES			UNIDADE
	LAJES	VIGAS	PILARES E PAREDES	
Resistência característica (Fck)	30	30	30	MPa
Consumo mínimo de cimento	300	300	300	Kg/m³
Fator água-cimento	0.50	0.50	0.50	—

- 5 – AÇOS:
- CA-50: Fyk = 500 MPa
- CA-60: Fyk = 600 MPa
- 6 – COBRIMENTO DAS ARMADURAS:
- Pilares: 3.0 cm
- Lajes: 2.5 cm
- Vigas: 3.0 cm
- Sopostos: 5.0 cm
- Tolerância para o cobrimento: 0.5 cm

DOBRAMENTO DAS BARRAS SEM ESCALA

DIMÊTROS DE DOBRAMENTOS

	CA-50 (Ø=40)	CA-60
< 20	3Ø	4Ø
> 20	4Ø	5Ø

EMENDAS

BITOLA (Ø)	TRANSPASSE (L)
4.0	50.0
6.3	50.0
8.0	80.0
10.0	80.0
12.5	100.0
16.0	120.0
20.0	160.0
25.0	200.0

QUANTITATIVOS DE FORMA E CONCRETO – COBERTURA		
ELEMENTOS	ÁREA DE FORMA (m2)	VOLUME DE CONCRETO (m3)
PILARES	285.00	18.92
VIGAS	382.00	31.72
LAJES	146.00	17.39
TOTAL	813.00	68.03

PREFEITURA MUNICIPAL DE IRUPUI

CONSTRUTORA: AVANTEC SOLUÇÕES EM ENGENHARIA

PROJETO EXECUTIVO DE ENGENHARIA E ARQUITETURA

TÍTULO: PROJETO ESTRUTURAL ESCOLA POLO - ETAPA 01

LOCAL: CORREGO BARRA GRANDE - IRUPUI

COORDENADOR: Eng.º CARLOS AUGUSTO DE MELLO DAMAS

AUTOR DO PROJETO: Eng.º CARLOS AUGUSTO DE MELLO DAMAS

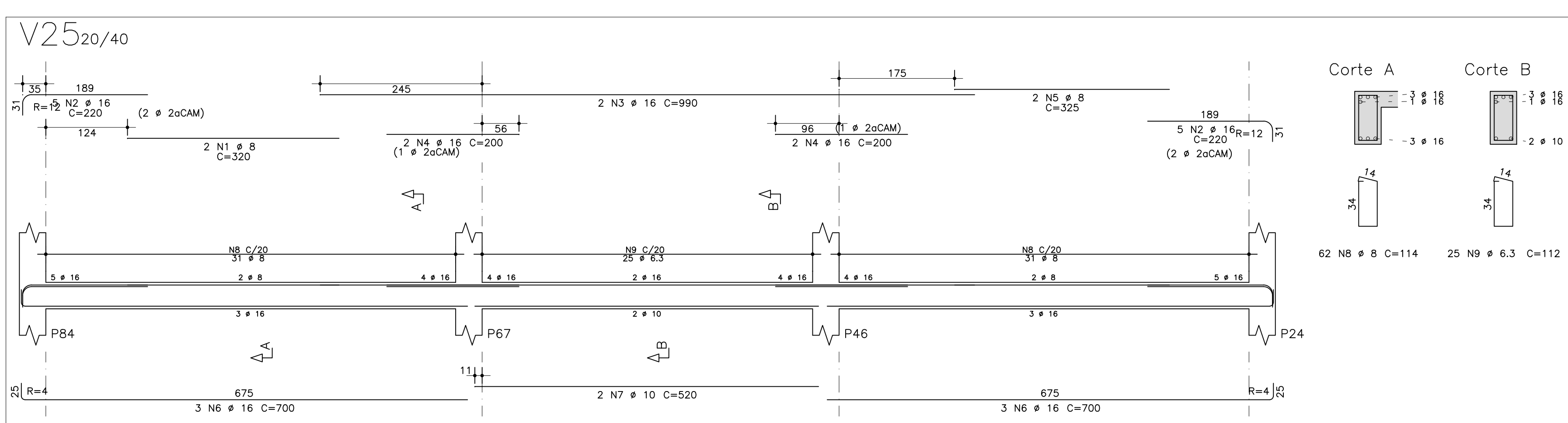
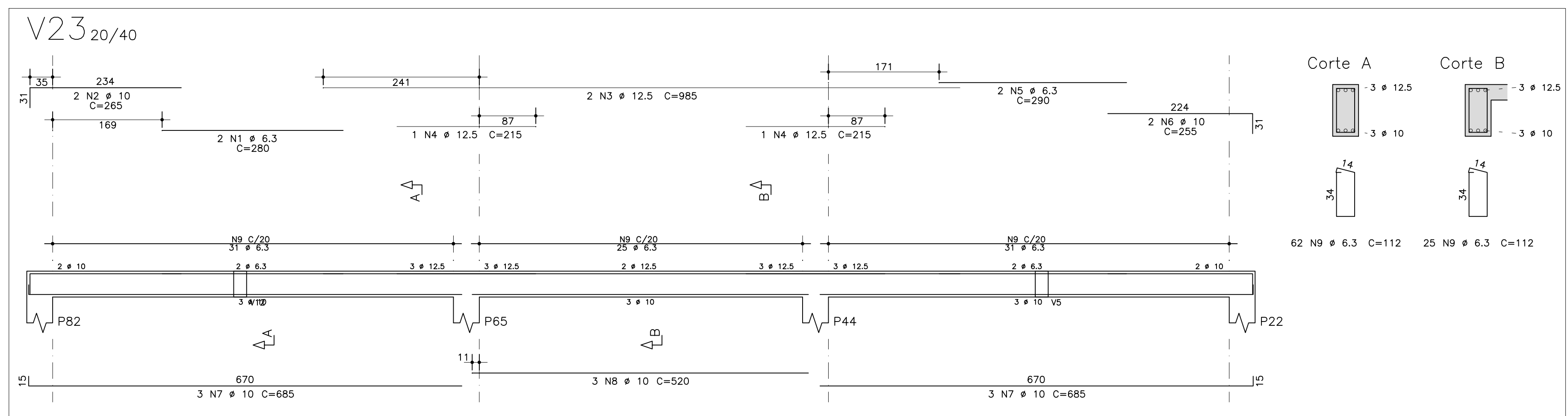
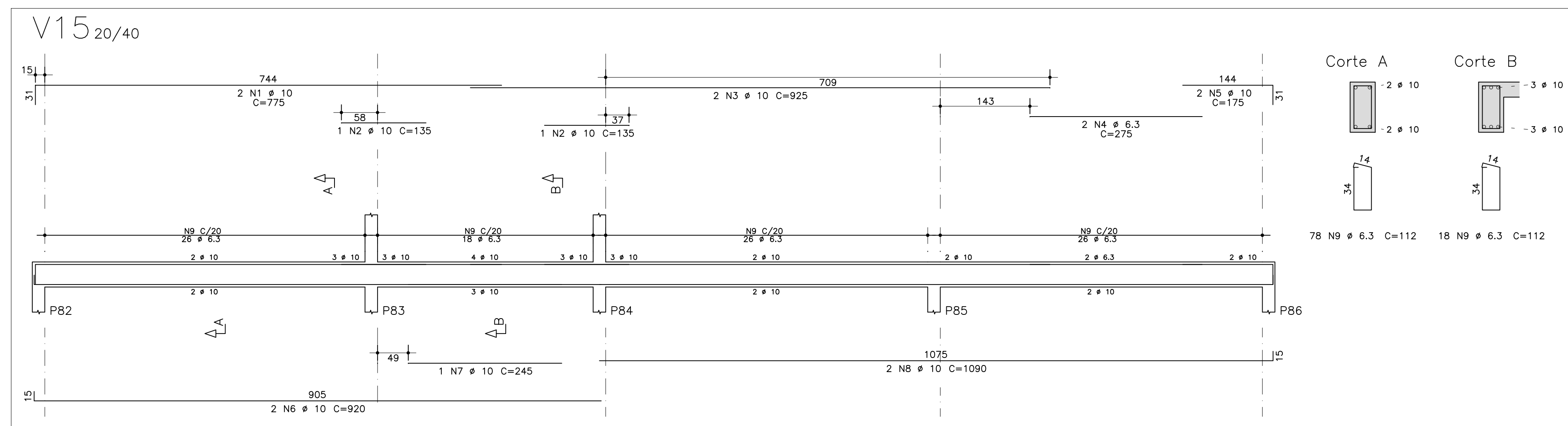
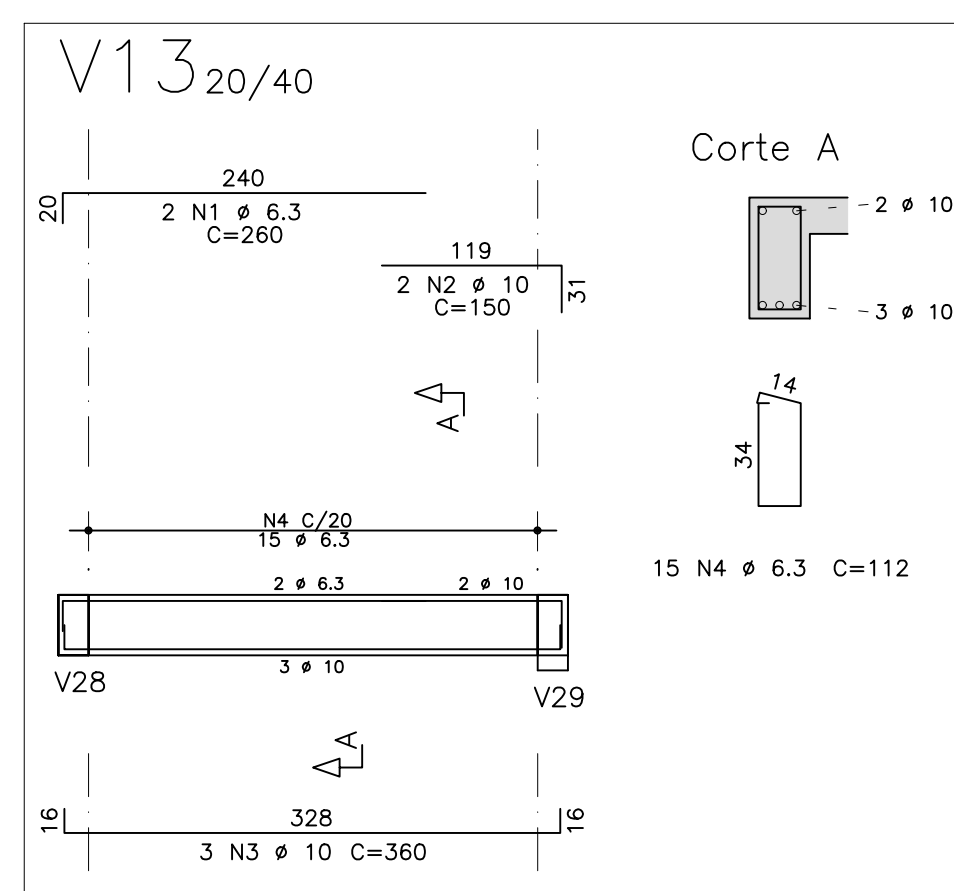
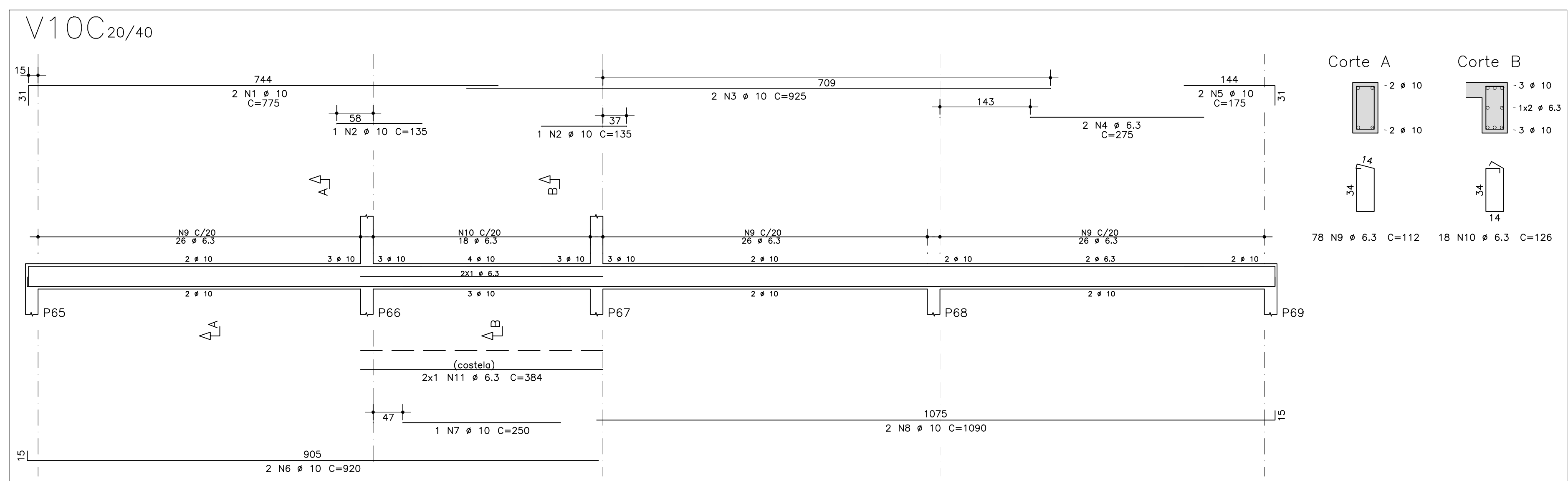
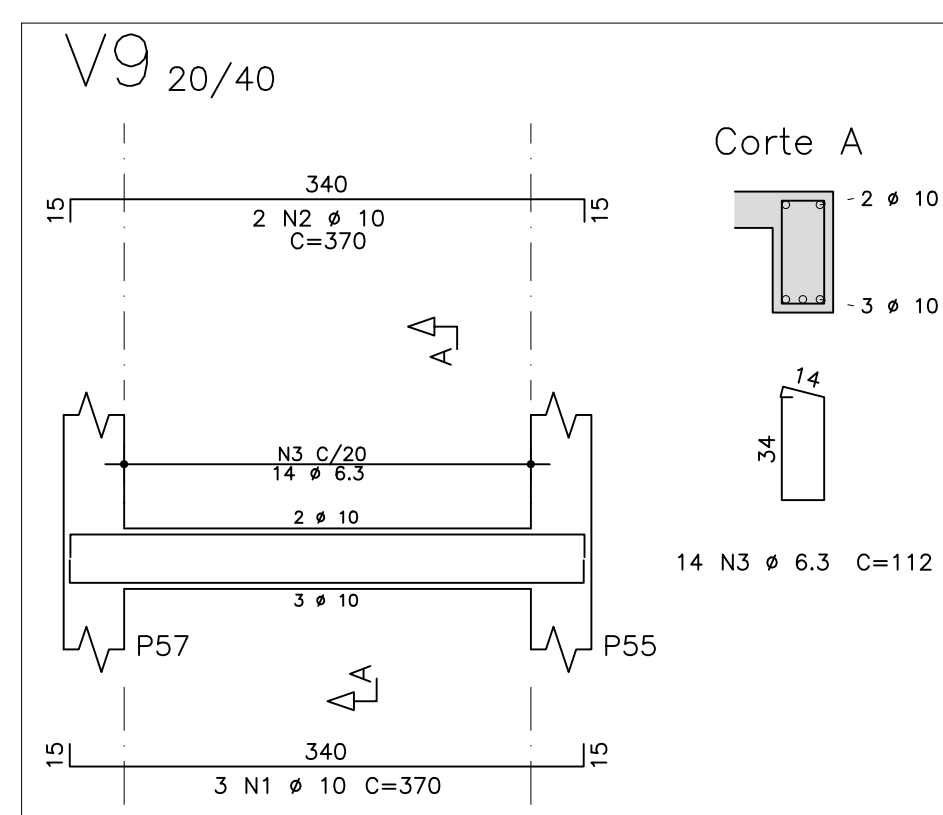
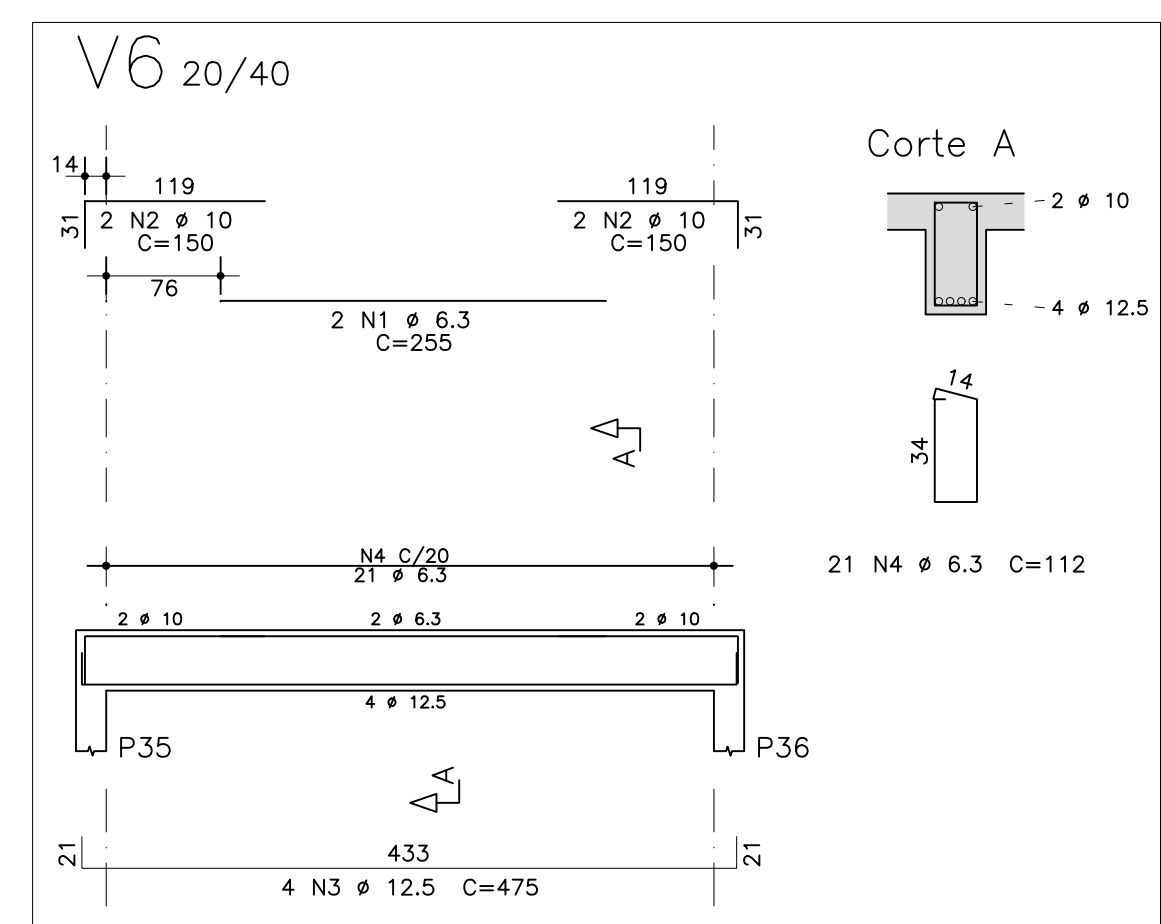
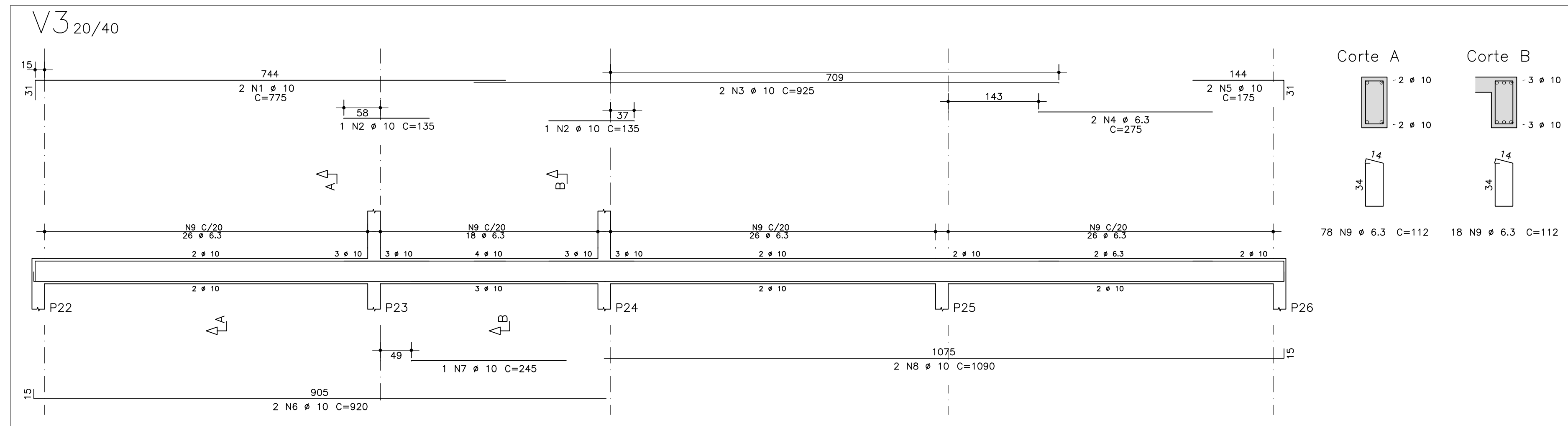
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ESCALA: INDICADA

FORMATO: A4

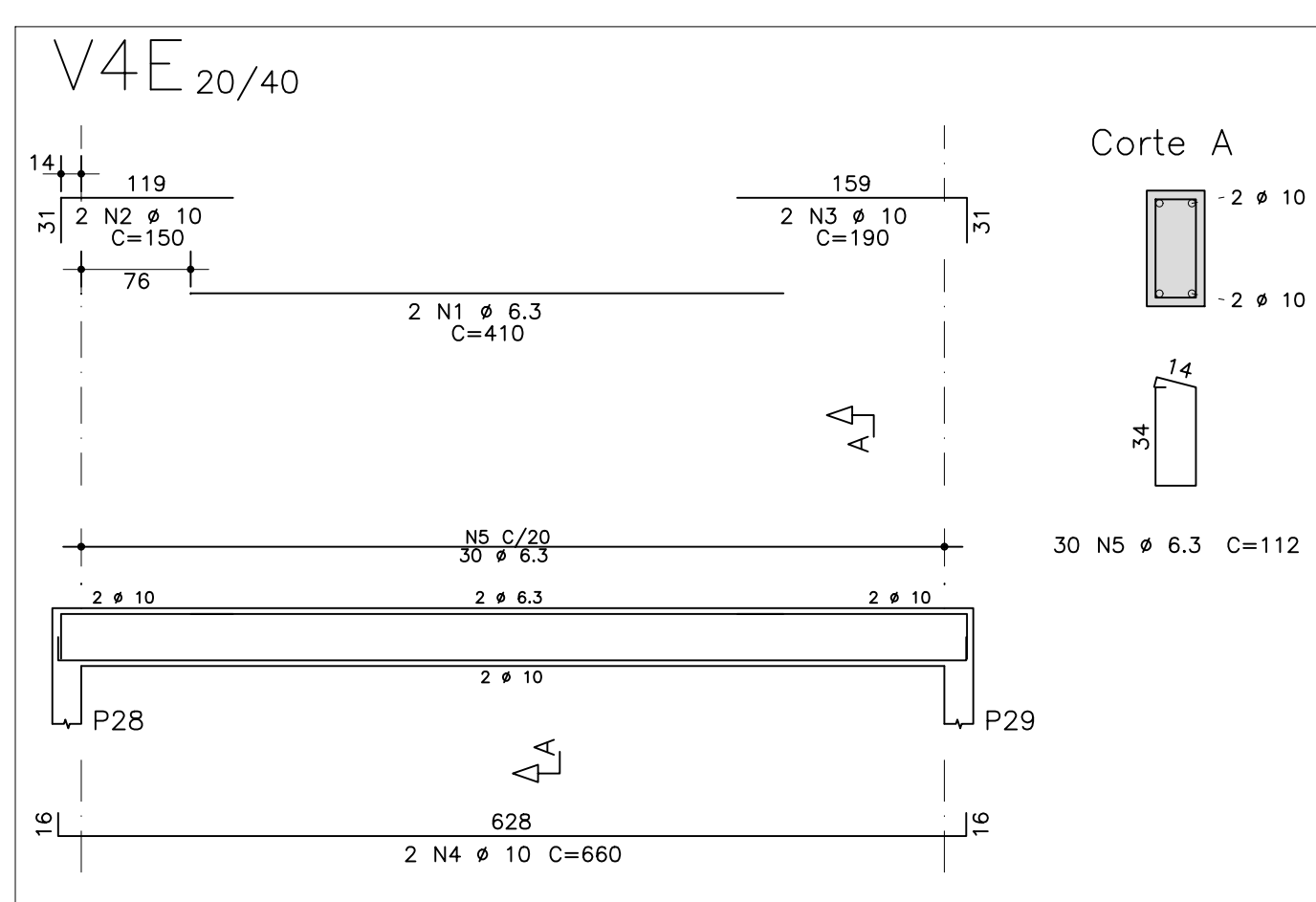
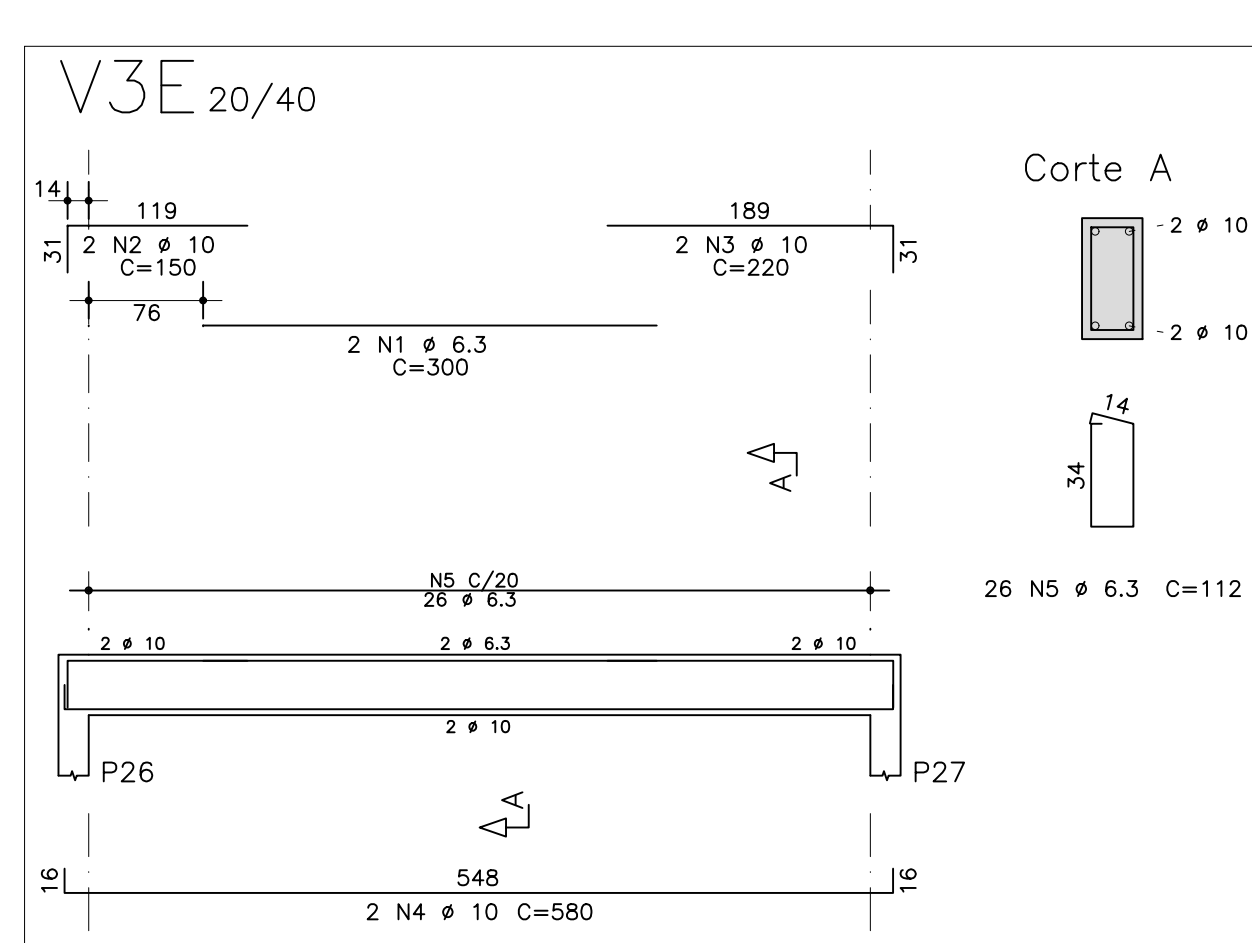
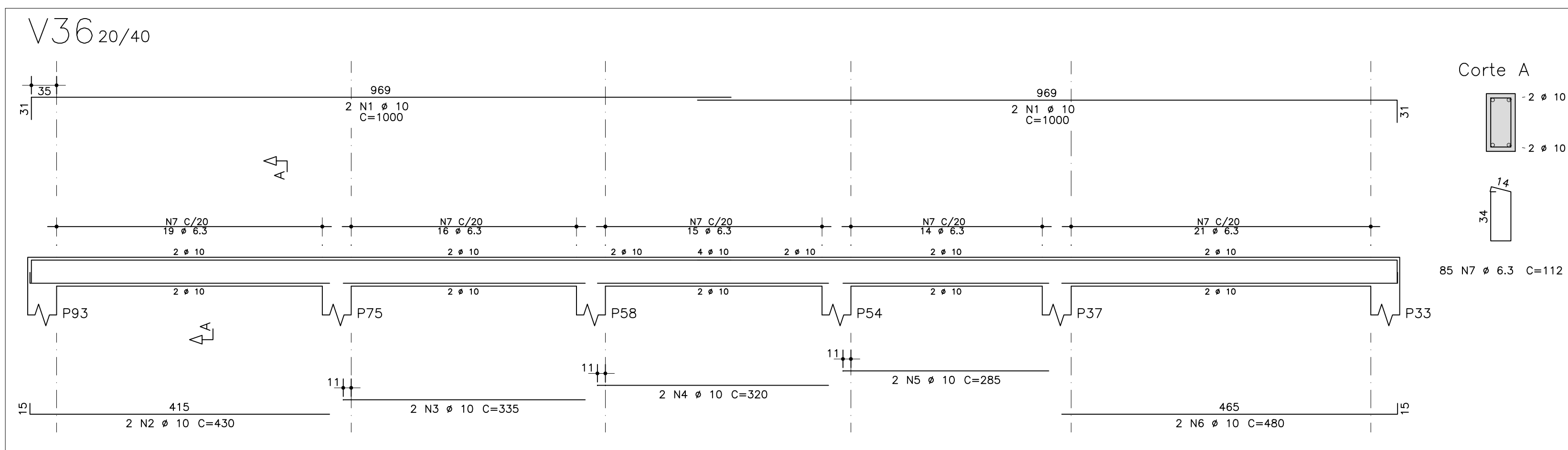
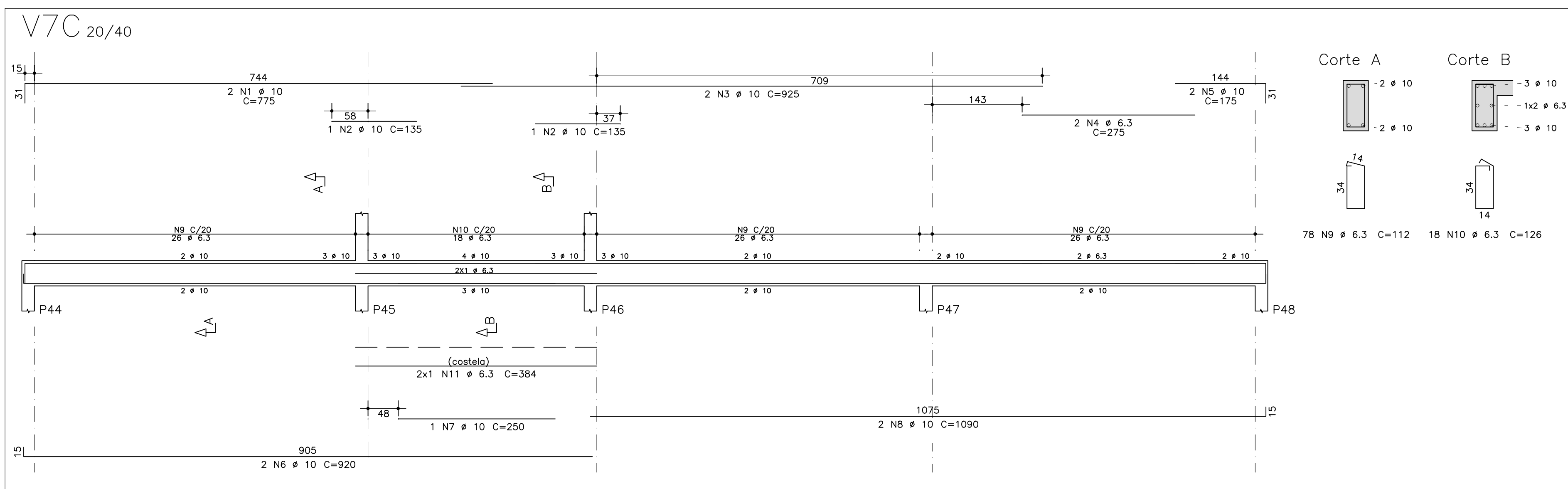
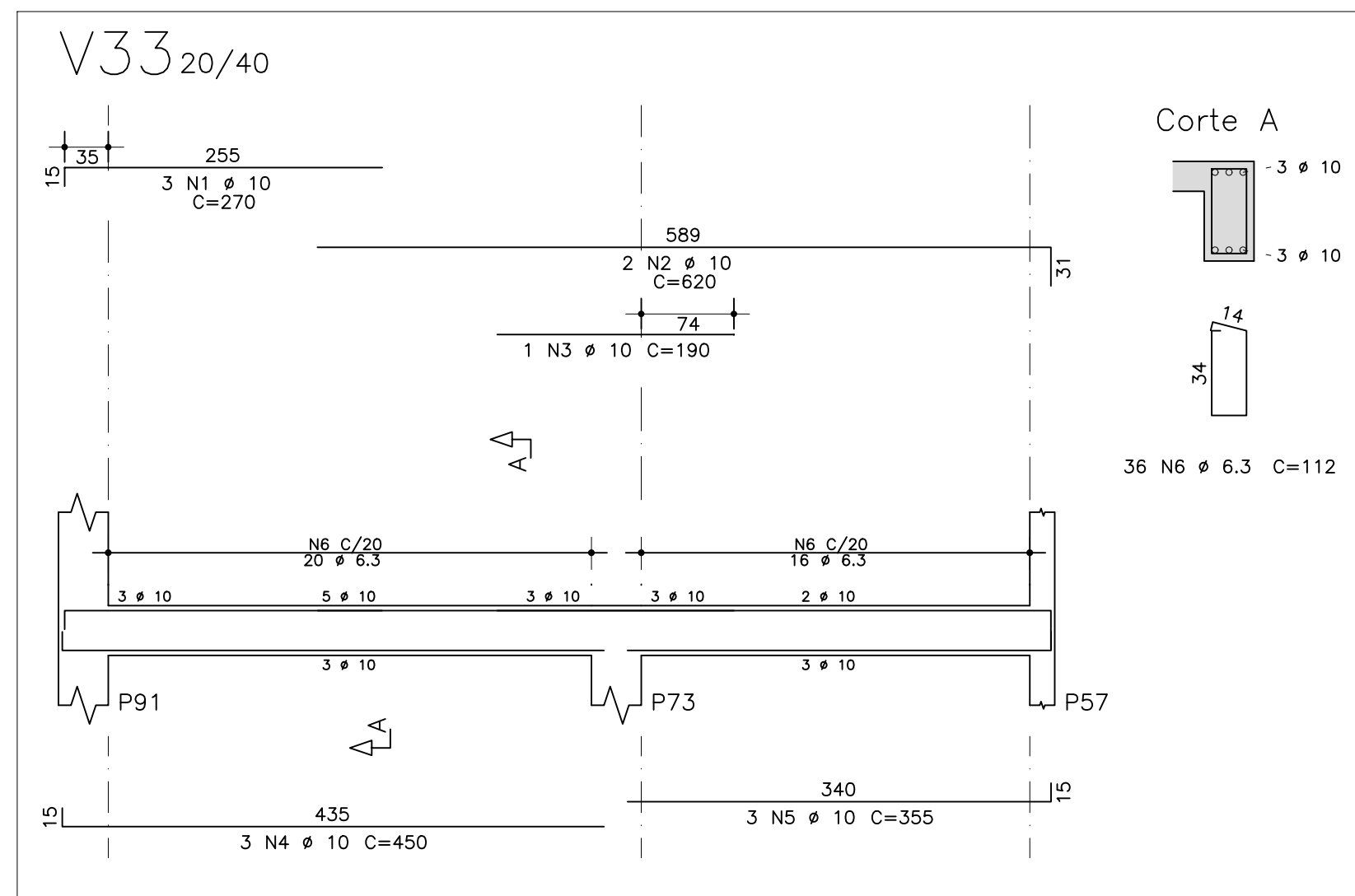
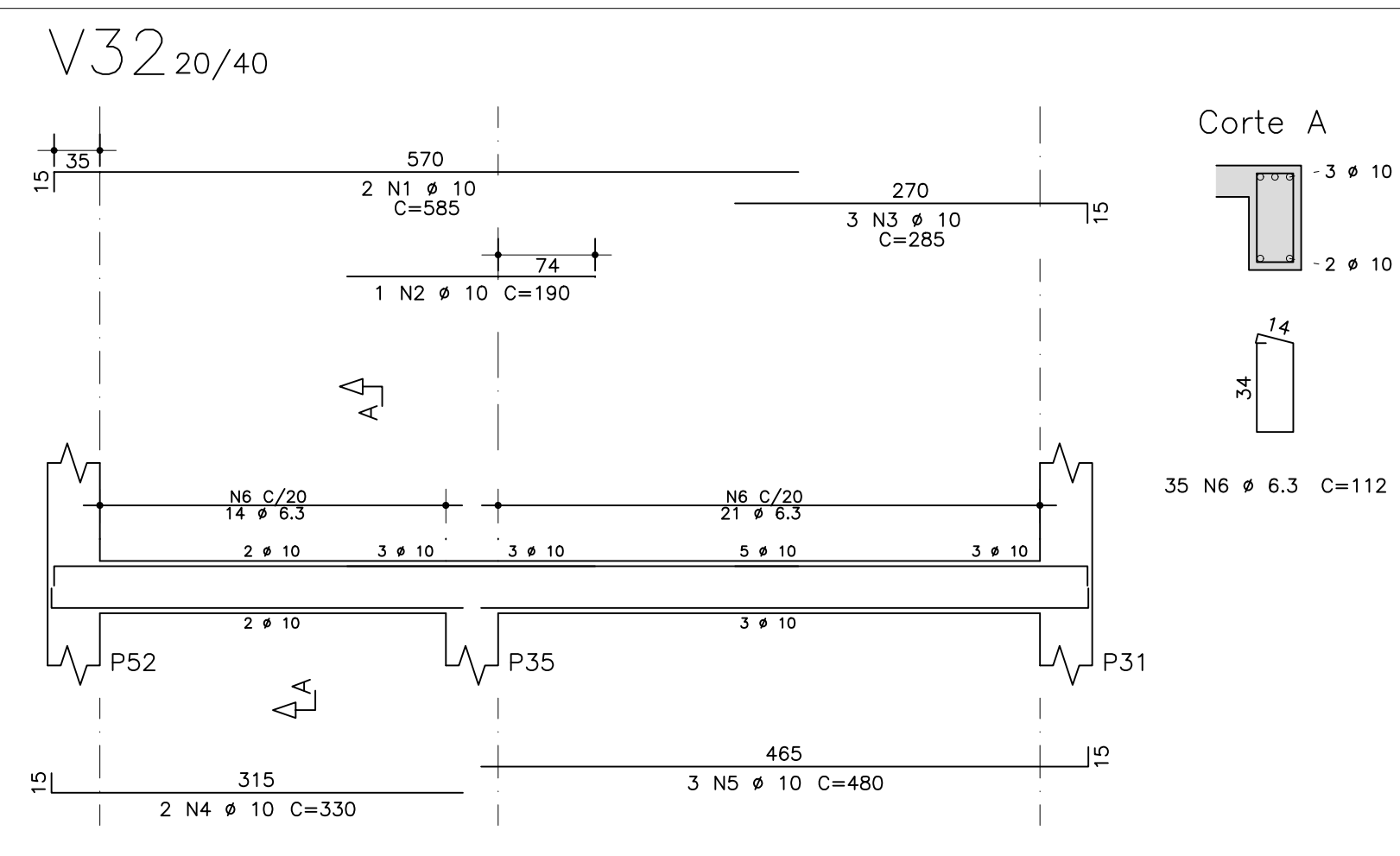
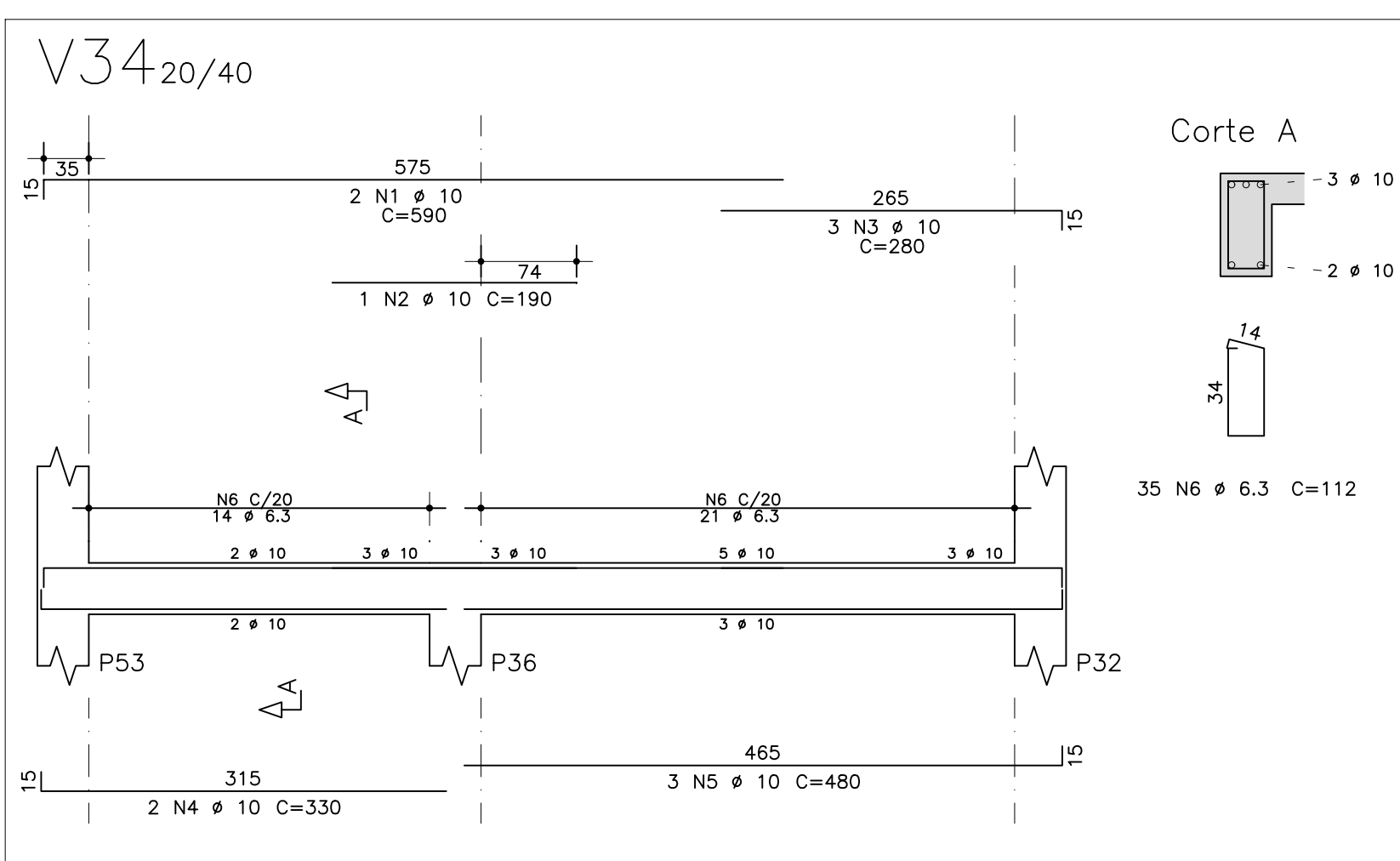
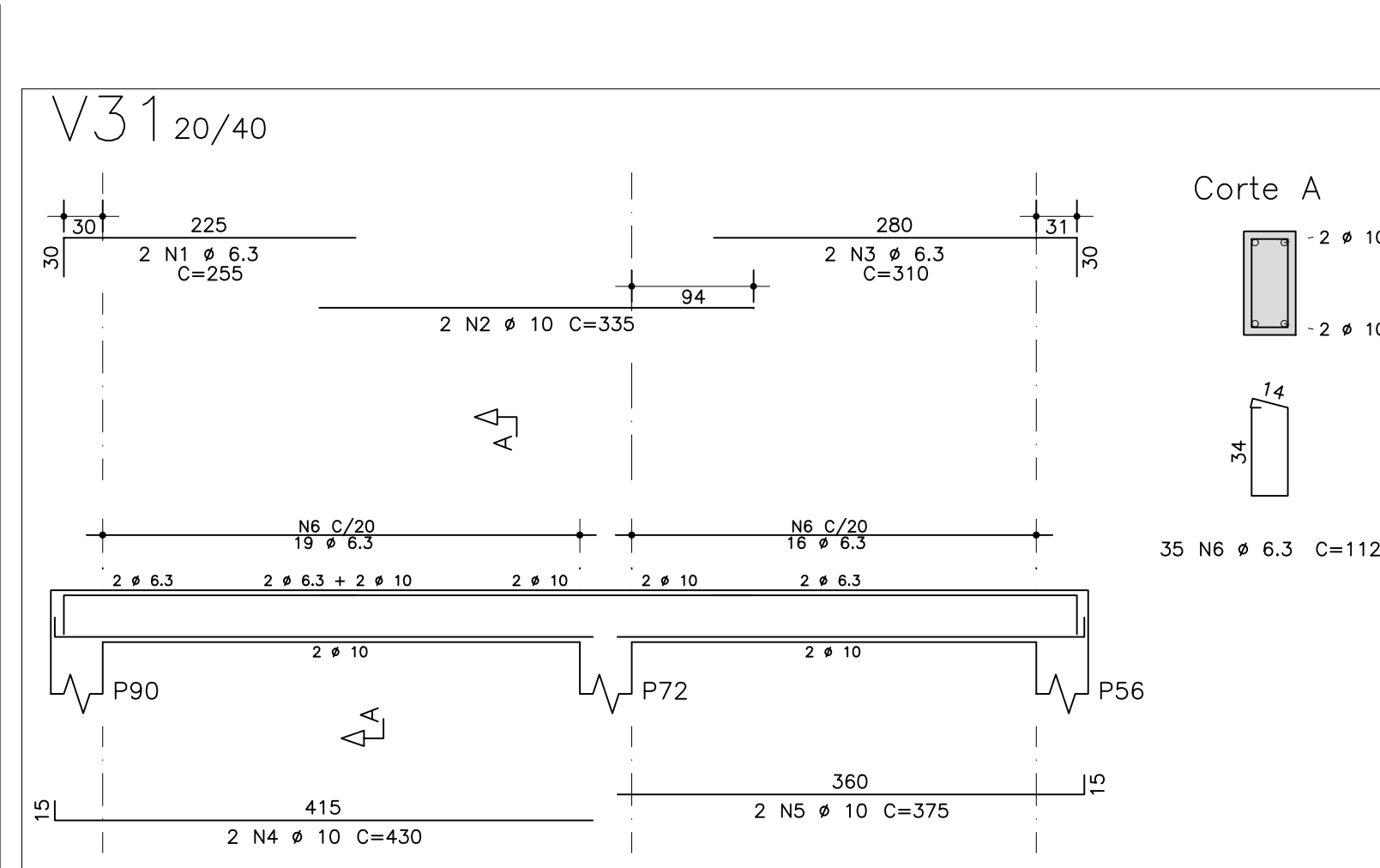
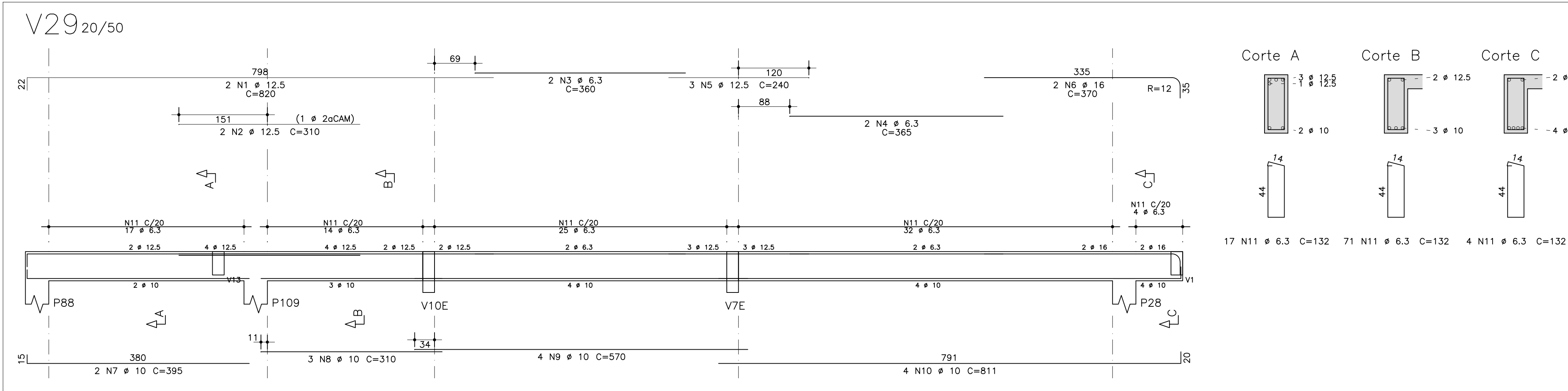
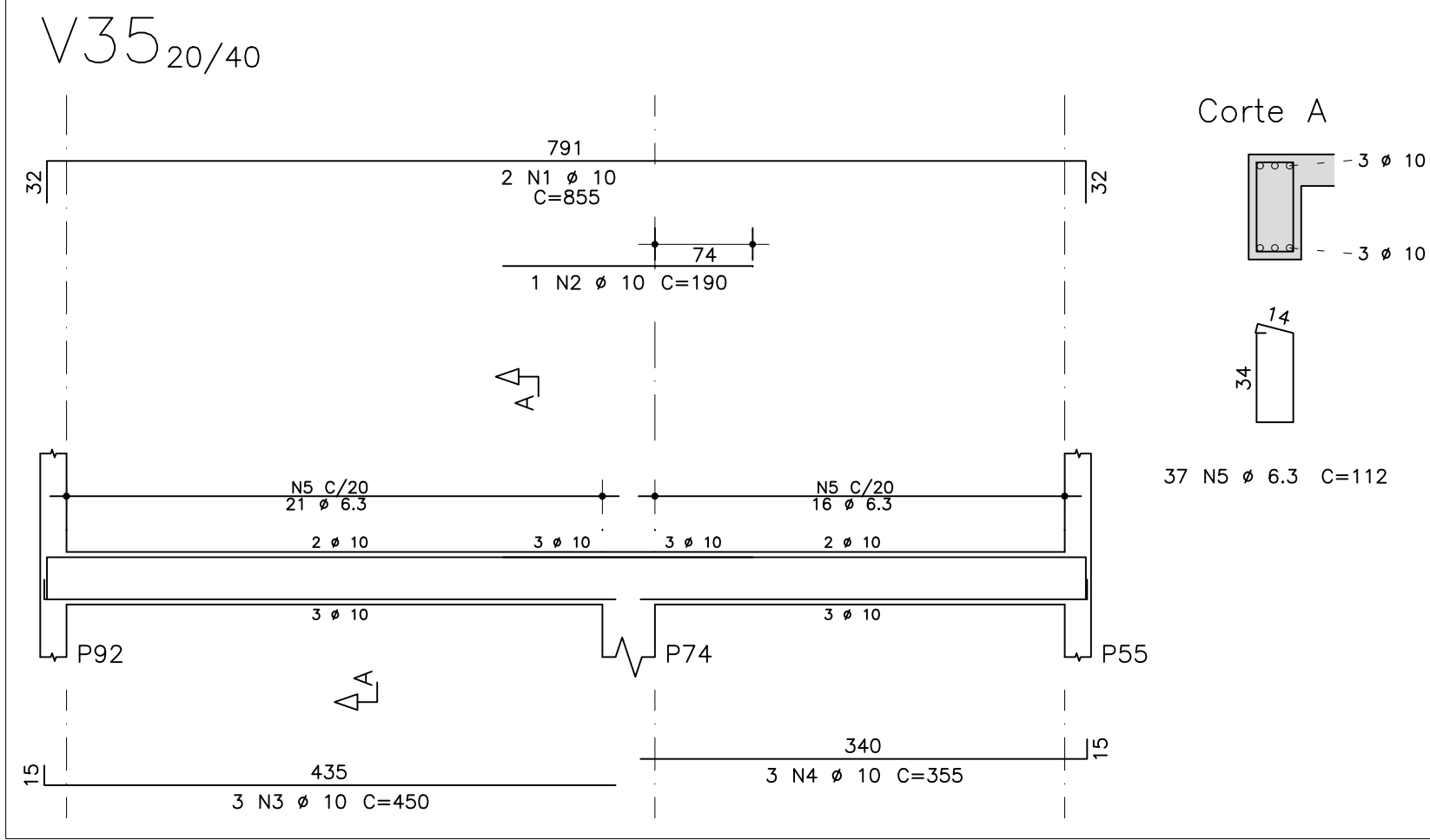
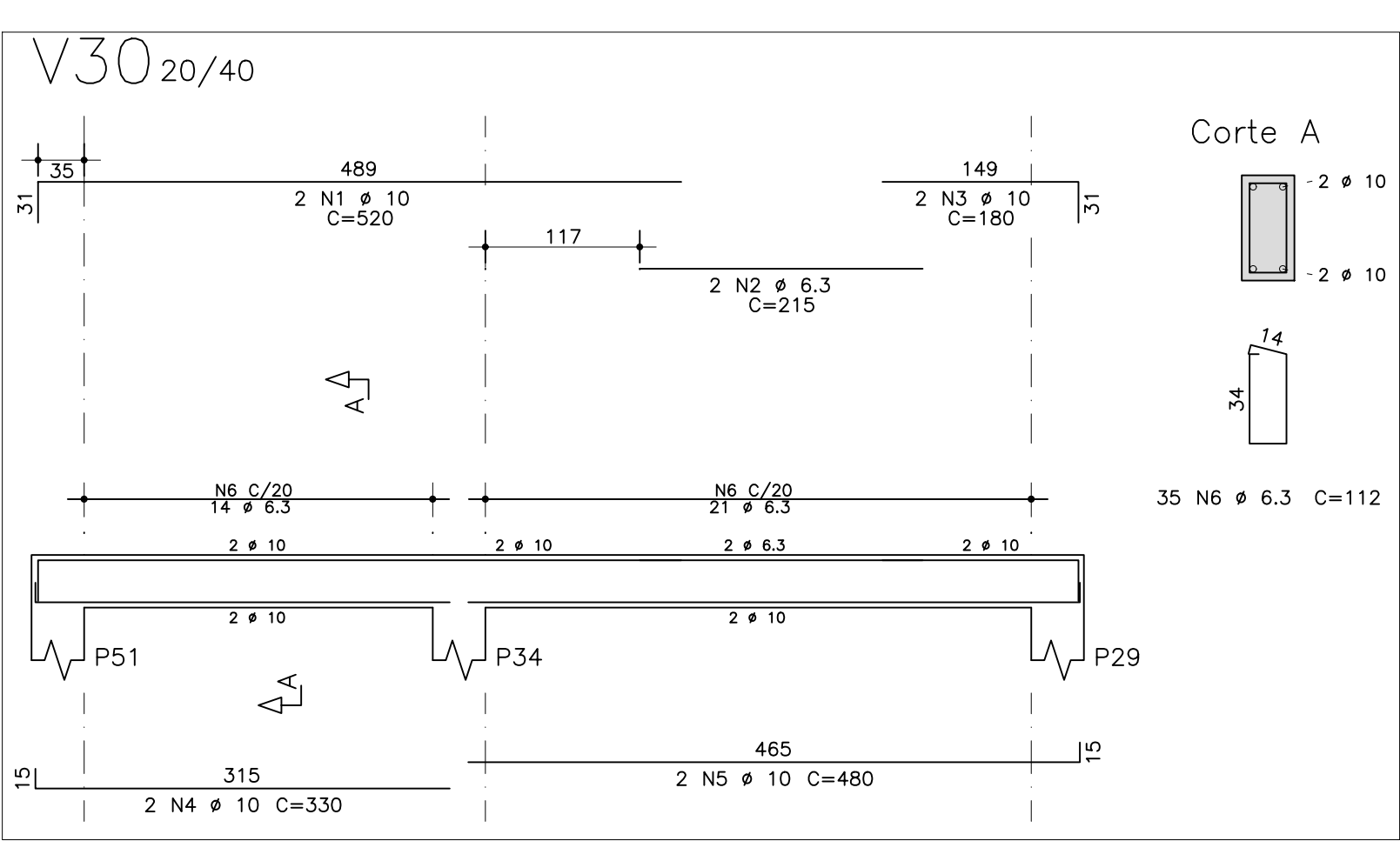
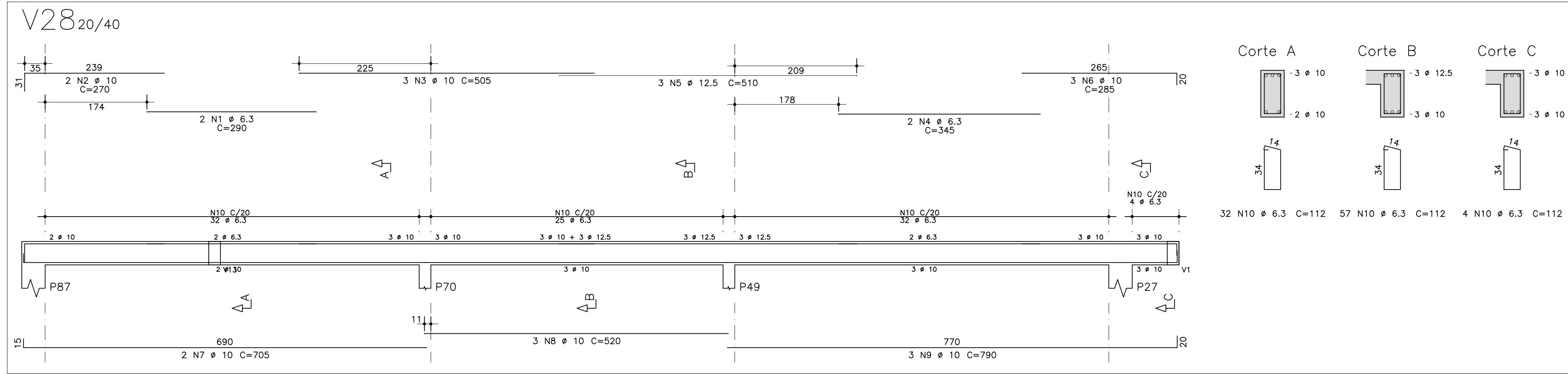
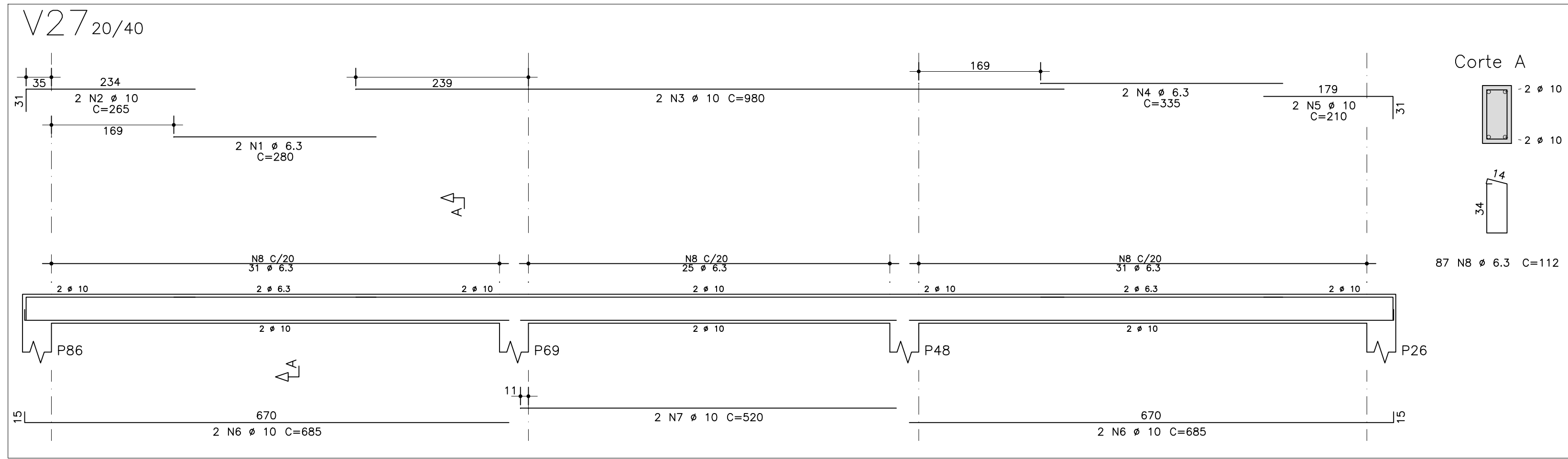
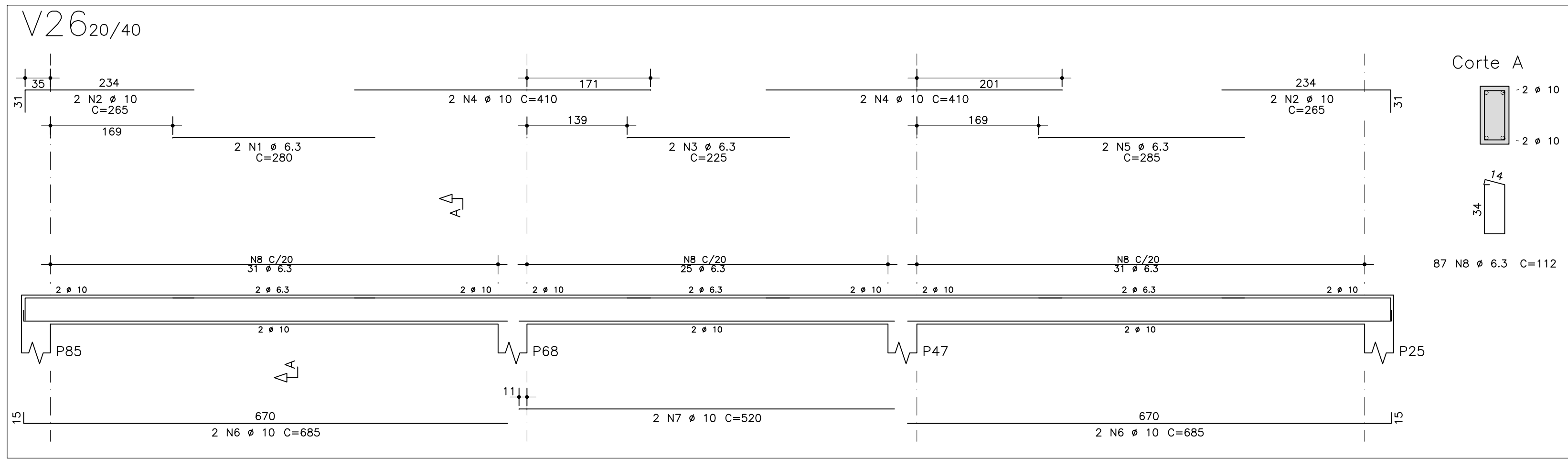
PRIMEIRA: 01

EST 010-14



	AÇO	POS	BIF	QUANT	COMPROMET.	
					UNIT	TOTAL
					cm	
V1	50A	1	6,3	2	370	740
	50A	2	10	2	600	1200
	50A	3	6,3	15	112	1680
V3	50A	1	10	2	775	1550
	50A	2	10	2	135	270
	50A	3	9,2	180	275	550
	50A	4	6,3	2	175	350
	50A	5	10	2	175	350
	50A	6	10	2	920	1840
	50A	7	10	2	145	290
	50A	8	10	2	1090	2180
	50A	9	6,3	96	112	10752
V6	50A	1	6,3	2	255	510
	50A	2	10	1	475	950
	50A	3	12,5	4	475	1900
V8	50A	1	6,3	2	255	510
	50A	2	10	4	150	600
	50A	3	10	1	465	1395
V9	50A	1	6,3	2	112	224
	50A	2	10	3	370	1110
	50A	3	6,5	14	112	1558
V10C	50A	1	10	2	775	1550
	50A	2	10	2	135	270
	50A	3	10	2	925	1850
	50A	4	6,3	2	275	550
	50A	5	10	2	175	350
	50A	6	10	2	1840	3680
	50A	7	10	1	250	250
	50A	8	10	1	1090	1090
	50A	9	6,3	78	112	8736
	50A	10	6,3	16	220	3520
	50A	11	6,3	76	364	7688
V11	50A	1	10	2	400	800
	50A	2	10	4	370	1480
	50A	3	6,5	16	112	1792
V13	50A	1	10	2	260	520
	50A	2	10	1	150	300
	50A	3	10	3	360	1080
V15	50A	1	6,3	2	280	560
	50A	2	10	2	135	270
	50A	3	10	2	925	1850
	50A	4	6,3	2	275	550
	50A	5	10	2	175	350
	50A	6	10	2	920	1840
	50A	7	10	1	245	245
V16F	50A	1	10	1	1090	1090
	50A	2	6,3	96	112	10752
	50A	1	2	1065	2130	
	50A	2	10	1	150	300
	50A	3	10	2	680	1360
	50A	4	10	1	145	145
V23	50A	1	10	2	870	1740
	50A	2	10	2	310	620
	50A	3	10	2	470	940
	50A	4	6,3	77	112	8624
	50A	1	6,3	2	280	560
	50A	2	10	2	135	270
	50A	3	12,5	2	985	1970
V24	50A	4	12,5	2	215	430
	50A	5	6,3	3	280	840
	50A	6	10	2	255	510
	50A	7	10	1	685	685
	50A	8	10	2	520	1040
	50A	9	6,3	87	112	9684
	50A	1	6,3	1	295	1180
V25	50A	2	20	6	245	1470
	50A	3	16	2	990	1980
	50A	4	16	4	200	800
	50A	5	12,5	8	990	5520
	50A	6	10	2	520	1040
	50A	7	6,3	87	112	9744
	50A	1	8	2	320	640
	50A	2	16	10	220	2200
	50A	3	16	10	990	1980
	50A	4	16	4	200	800
	50A	5	8	32	8	256
	50A	6	16	6	700	4200
	50A	7	8	62	114	7068

RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
	mm	m	kgf
50A	6,3	819	201
50A	8	84	33
50A	10	489	308
50A	12,5	98	95
50A	16	120	189
50A	20	15	36
Peso Total	50A =		861 kof



AÇO	POS	BIT	QUANT	COMPRIMENTO
		mm		cm
V3E				
50A	1	6.3	2	305
50A	2	10	2	150
50A	3	10	2	220
50A	4	10	2	580
50A	5	6.3	26	112
V4E				
50A	1	6.3	2	410
50A	2	10	2	150
50A	3	10	2	190
50A	4	10	2	660
50A	5	6.3	30	112
V7C				
50A	1	10	2	775
50A	2	10	2	135
50A	3	10	2	925
50A	4	6.3	2	275
50A	5	10	2	175
50A	6	10	2	920
50A	7	6.3	78	112
50A	8	6.3	18	126
50A	11	6.3	2	384
V26				
50A	1	6.3	2	280
50A	2	10	2	285
50A	3	6.3	2	225
50A	4	6.3	2	410
50A	5	6.3	2	285
50A	6	10	4	685
50A	7	10	4	520
50A	8	6.3	87	112
V27				
50A	1	6.3	2	280
50A	2	10	2	285
50A	3	10	2	180
50A	4	6.3	2	335
50A	5	10	2	210
50A	6	10	4	685
50A	7	10	4	520
50A	8	6.3	87	112
V28				
50A	1	6.3	2	290
50A	2	10	2	270
50A	3	10	2	305
50A	4	6.3	2	345
50A	5	12.5	2	510
50A	6	10	3	285
50A	7	10	3	705
50A	8	10	3	520
50A	9	6.3	93	112
V29				
50A	1	12.5	2	820
50A	2	12.5	2	310
50A	3	6.3	2	620
50A	4	6.3	2	365
50A	5	12.5	2	240
50A	6	16	2	570
50A	7	10	4	395
50A	8	10	4	310
50A	9	10	4	570
50A	10	6.3	92	132
V30				
50A	1	10	2	520
50A	2	10	2	190
50A	3	10	2	180
50A	4	10	2	330
50A	5	10	3	480
50A	6	6.3	35	112
V31				
50A	1	6.3	2	255
50A	2	10	2	335
50A	3	10	2	310
50A	4	10	2	430
50A	5	10	3	375
50A	6	6.3	35	112
V32				
50A	1	10	2	585
50A	2	10	1	190
50A	3	10	3	285
50A	4	10	2	330
50A	5	10	3	480
50A	6	6.3	35	112
V33				
50A	1	10	3	270
50A	2	10	1	190
50A	3	10	1	190
50A	4	10	3	450
50A	5	10	3	355
50A	6	6.3	36	112
V34				
50A	1	10	2	590
50A	2	10	1	190
50A	3	10	3	280
50A	4	10	2	330
50A	5	10	3	480
50A	6	6.3	35	112
V35				
50A	1	10	2	855
50A	2	10	2	335
50A	3	10	3	450
50A	4	10	2	355
50A	5	6.3	37	112
V36				
50A	1	10	4	1000
50A	2	10	2	430
50A	3	10	2	670
50A	4	10	2	320
50A	5	10	2	285
50A	6	10	2	480
50A	7	6.3	85	112

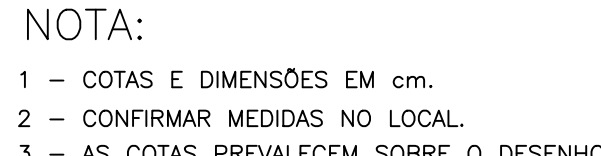
RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
		mm	kgf
50A	6.3	1025	251
50A	10	714	441
50A	12.5	45	43
50A	16	7	12
Peso total 50A =			747 kgf

VIGAMENTO DA COBERTURA 02/02
(ESCALA 1:50)

 PREFEITURA MUNICIPAL DE IRUPÉ		avanteo	
COORDENADOR: AVANTEC SOLUÇÕES EM ENGENHARIA		TÍTULO: PROJETO EXECUTIVO DE ENGENHARIA E ARQUITETURA	
LOCAL: CORREGO BARRA GRANDE - IRUPÉ			
COORDENADOR: ENG.º CARLOS EDUARDO DE MELLO DAS			
AUTOR DO PROJETO: ENG.º CARLOS EDUARDO DE MELLO DAS		CREA:	ESCALA:
DATA:		FORMATO:	PLANCHA:
EST.012-14		2025	



RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
	mm	m	kgf
50A	6.3	1678	411
50A	8	203	80
50A	10	24	15
Peso Total	50A =		506 kgf

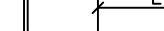


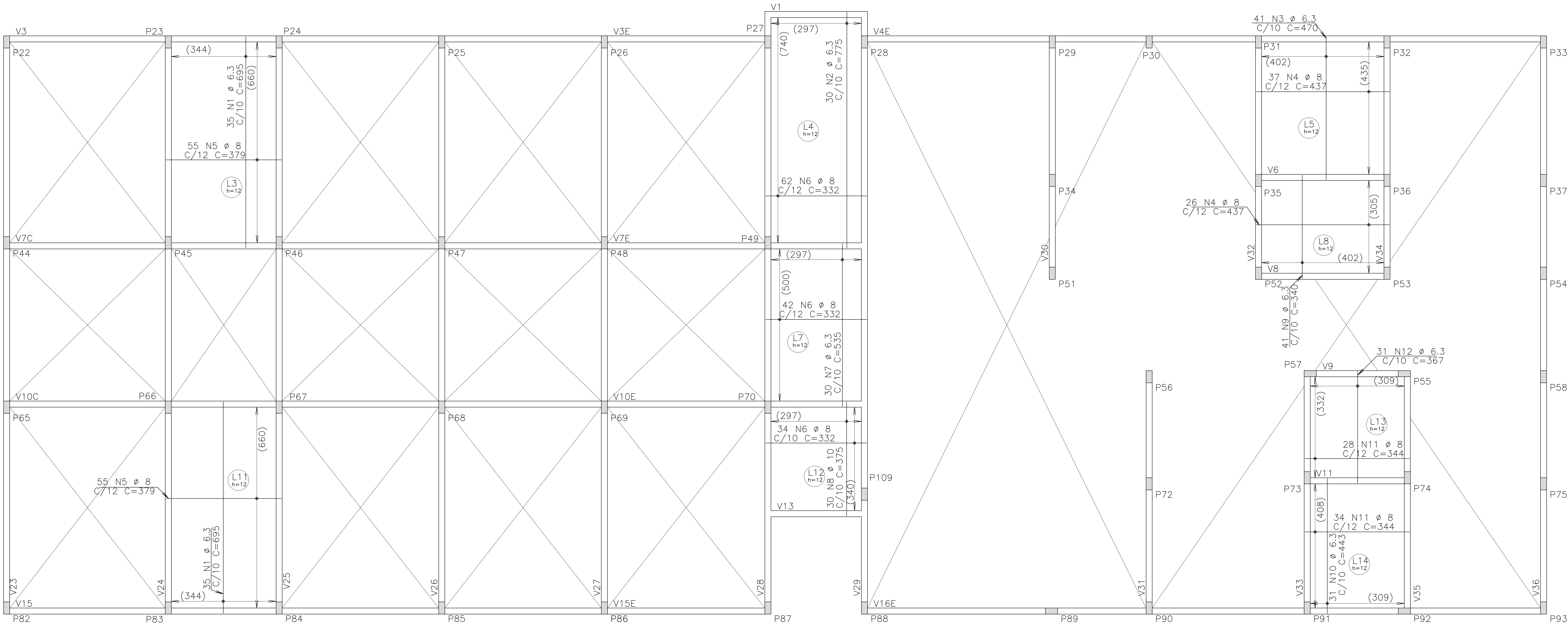
5 - AÇÓS:

CA-50:	F _{yk} = 500 MPa
CA-60:	F _{yk} = 600 MPa

6 - COBRIMENTO DAS ARMADURAS:

Pilares:	3.0 cm
Lajes:	2.5 cm
Vigas:	3.0 cm
Sapatas:	5.0 cm
Tolerância para o cobrimento:	0.5 cm

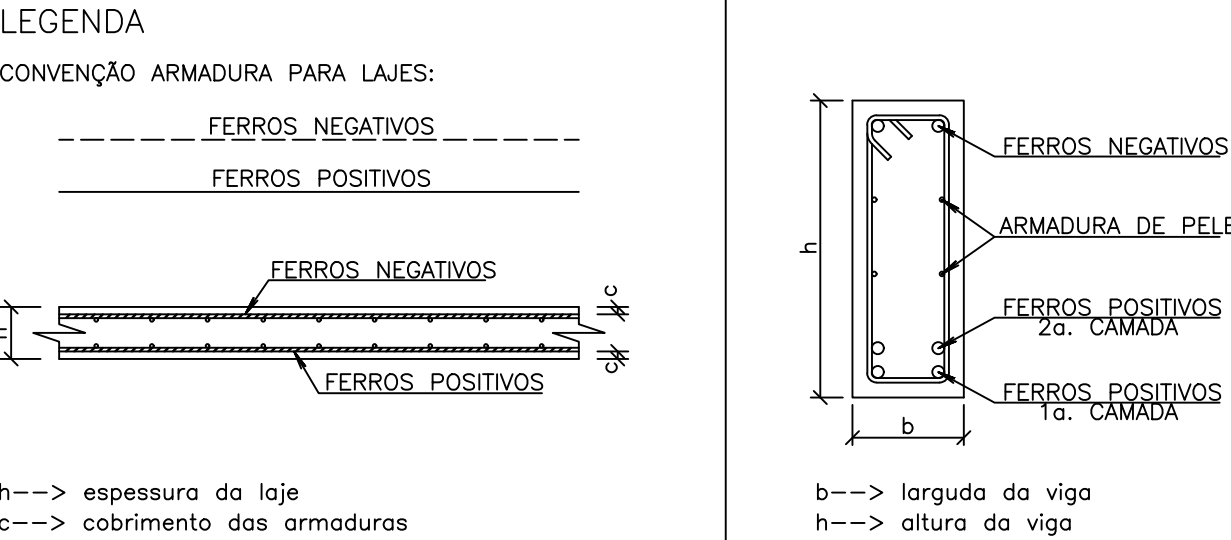
DIÁMETROS DE CORRIENTES						EMENDAS		
#	CA-50	CA-60				BITOLA (ø)	TRANSPASSE (L)	
< 20	5ø	6ø				5,0	50,0	
> 20	8ø	—				6,3	50,0	
						8,0	80,0	
						10,0	80,0	
						12,5	100,0	
						16,0	120,0	
						20,0	160,0	
						25,0	200,0	



○ ARMAÇÃO POSITIVA DAS LAJES DA COBERTURA – ETAPA 1
(ESCALA 1:50)

AÇO	POS	BIT	QUANT	COMPRIMENTO	
				UNIT	TOTAL
				cm	cm
ARMAÇÃO DAS LAJES DA COBERTURA – ETAPA 1					
50A	1	6.3	70	695	48650
50A	2	6.3	30	775	23250
50A	3	6.3	41	470	19270
50A	4	8	63	437	27531
50A	5	8	110	379	41690
50A	6	8	138	332	45816
50A	7	6.3	30	535	16050
50A	8	10	30	375	11250
50A	9	6.3	41	340	13940
50A	10	6.3	31	443	13733
50A	11	8	62	344	21328
50A	12	6.3	31	367	11377

RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
	mm	m	kgf
50A	6.3	1463	358
50A	8	1364	539
50A	10	113	69
Peso Total		50A =	966 kgf



NOTA:

1 – COTAS E DIMENSÕES EM CM.

2 – CONFIRMAR MEDIDAS NO LOCAL.

3 – AS COTAS PREVALECEM SOBRE O DESENHO.

4 – CONCRETO:

PROPRIEDADE	VALORES			UNIDADE
	LAJES	VIGAS	PILARES E PAREDES	
Resistência característica (Fck)	30	30	30	MPa
Consumo mínimo de cimento	300	300	300	Kg/m ³
Toler. água-cimento	0.50	0.50	0.50	--

5 – AÇOS:

CA-50: Fyk = 500 MPa

CA-60: Fyk = 600 MPa

6 – COBRIMENTO DAS ARMADURAS:

Pilares: 3.0 cm

Lajes: 2.5 cm

Vigas: 3.0 cm

Sapatas: 5.0 cm

Tolerância para o cobrimento: 0.5 cm

DOBRAMENTO DAS BARRAS SEM ESCALA

DIÂMETROS DE DOBRAMENTOS		D	EMENDAS	
Ø (mm)	Ø (mm)		BITOLA (Ø)	TRAVESSASSE (L)
< 20	20	D	4.0	50.0
> 20	20		6.3	50.0
			8.0	80.0
			10.0	80.0
			12.5	100.0
10.0	10.0		16.0	120.0
12.5	12.5		20.0	160.0
16.0	16.0		25.0	200.0