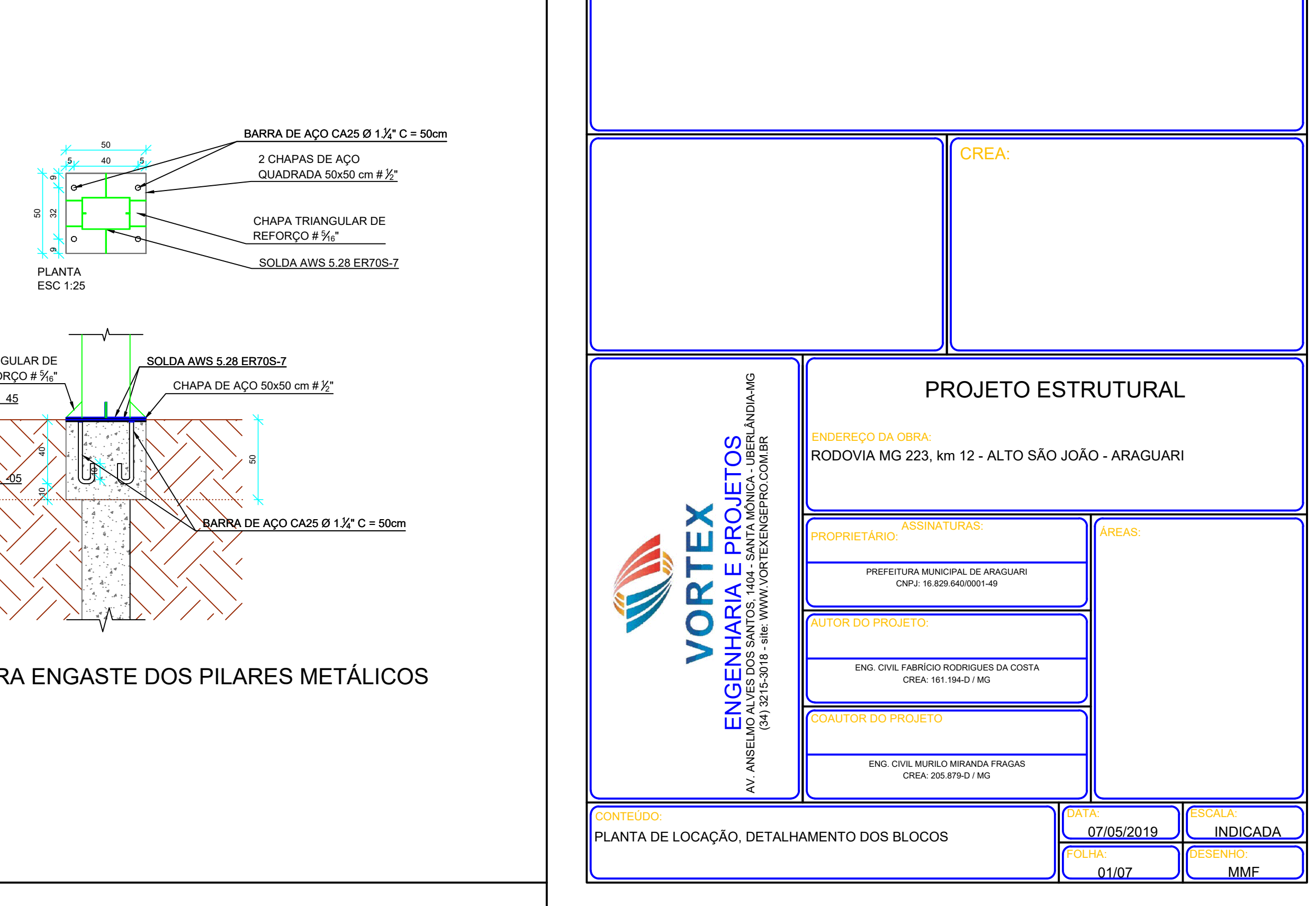
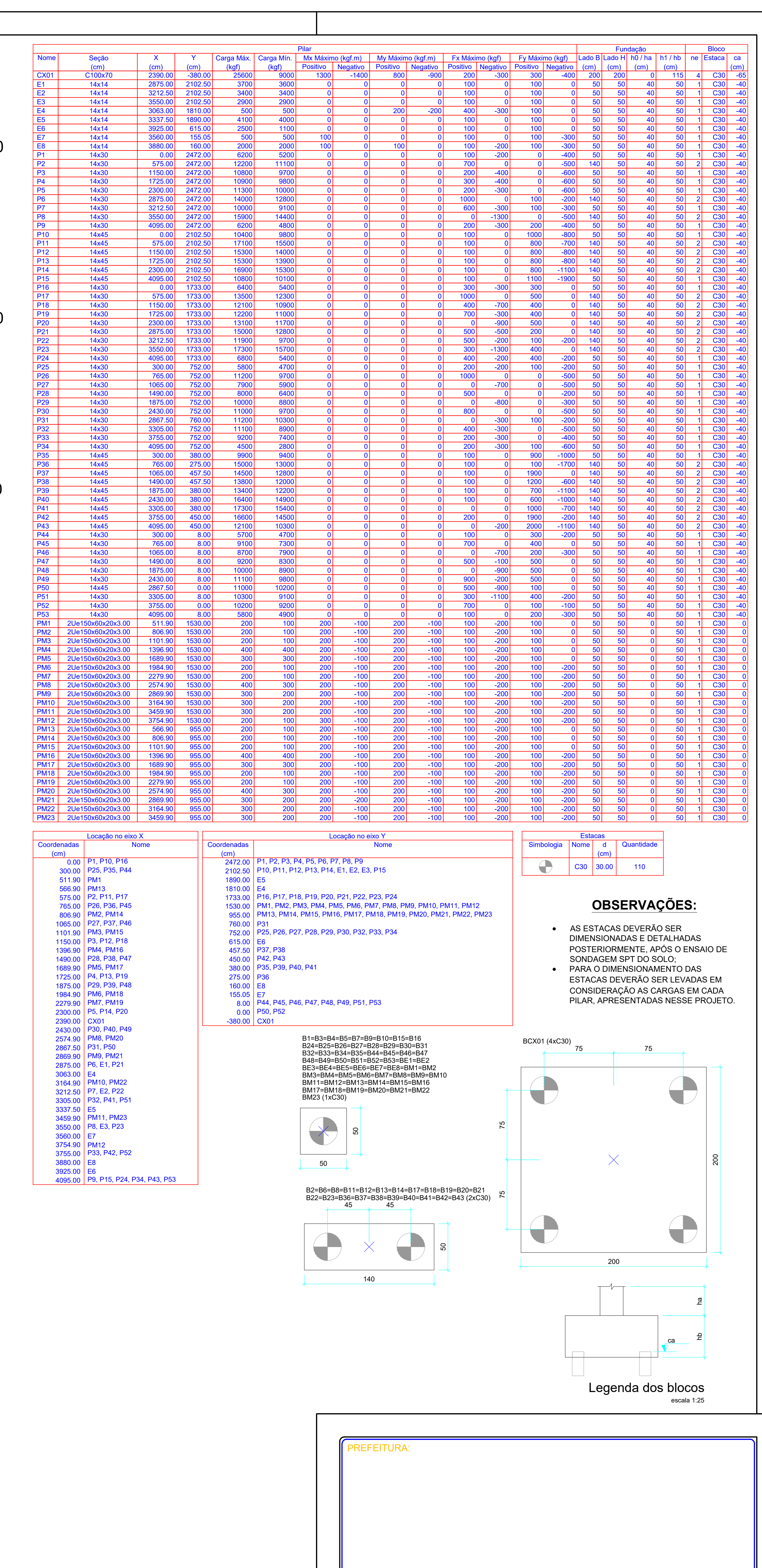
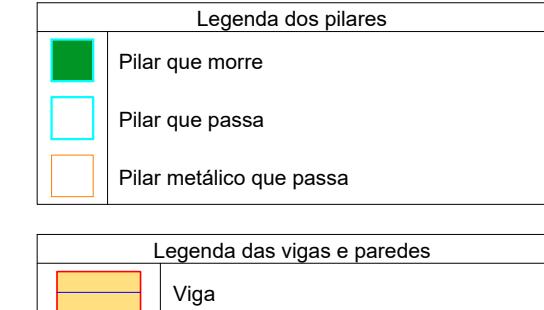
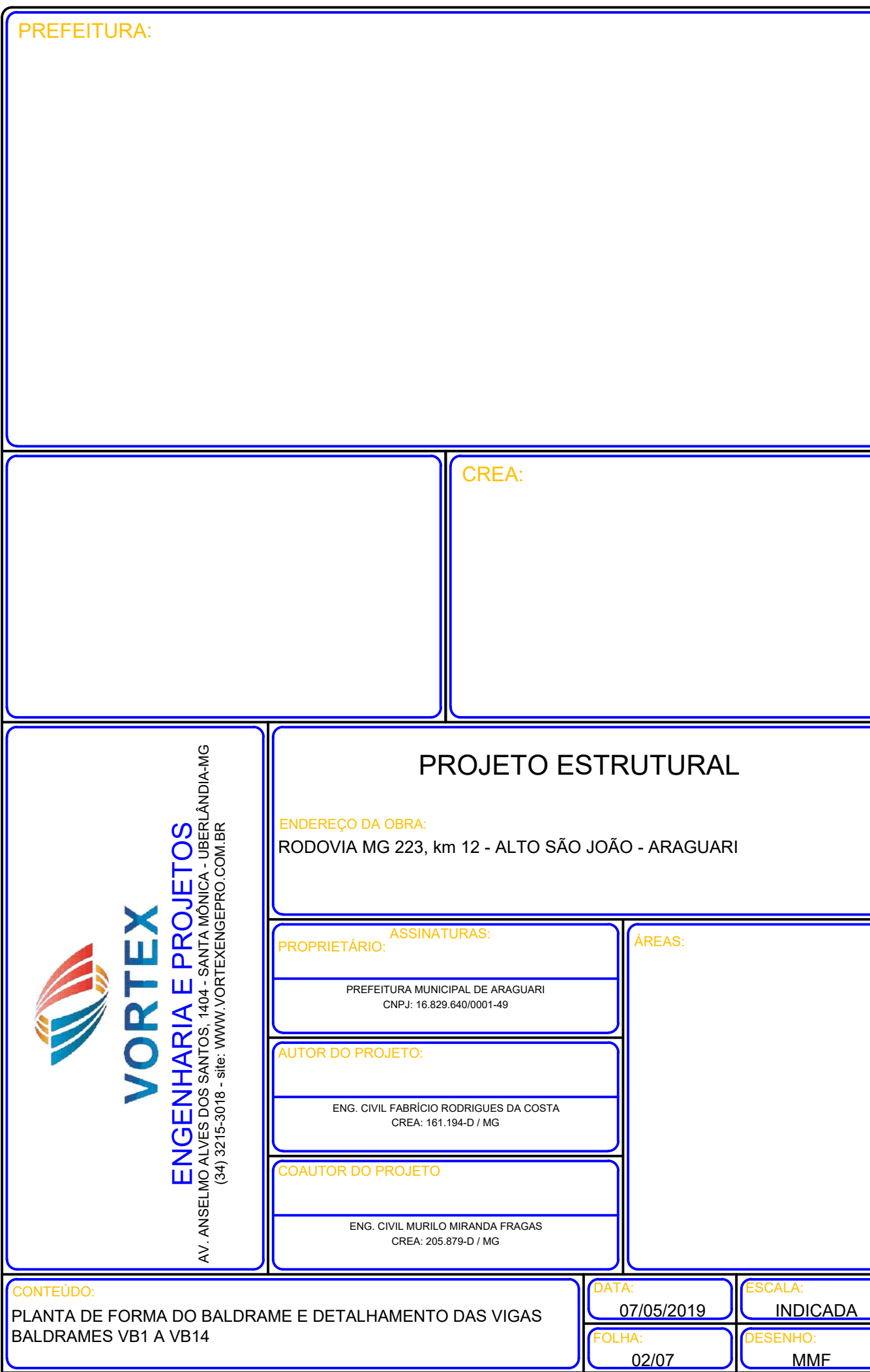
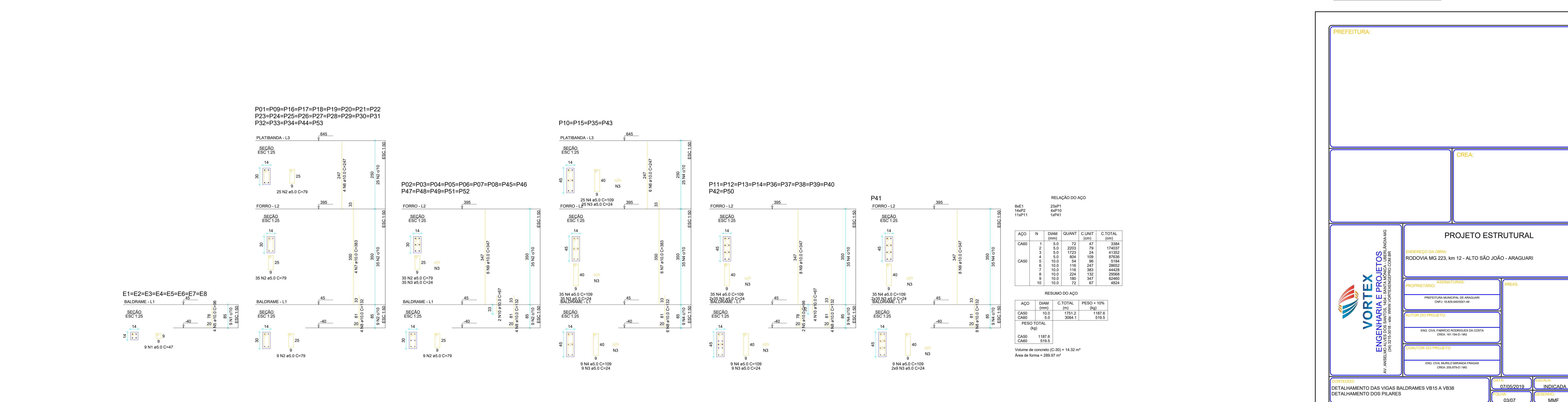
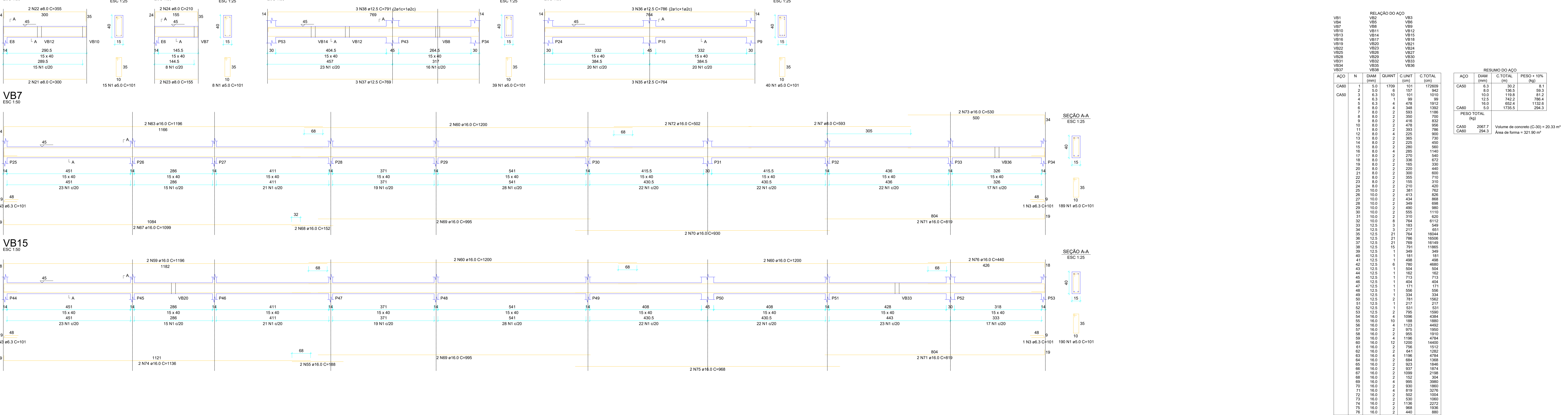
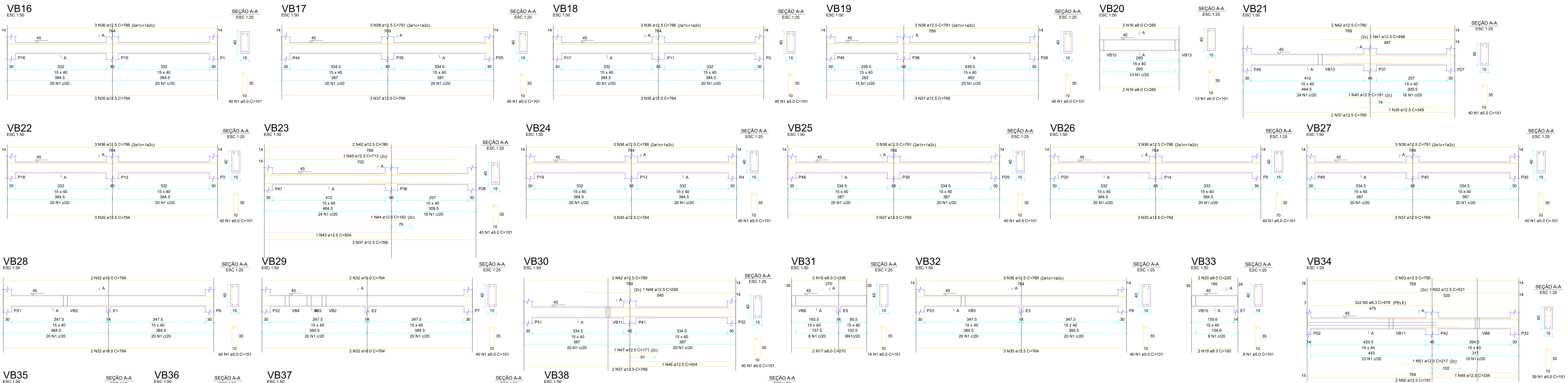






AÇO	DIAM (mm)	C.TOTAL	PESO + 10% (kg)
CA50	6.3	30.2	8.1
	8.0	136.5	59.3
	10.0	119.8	81.2
	12.5	74.2	79.6
	16.0	65.2	113.6
CA80	5.0	1735.5	294.3
PESO TOTAL (kg)			
CA50	2067.7	Volume de concreto (C-30) = 20.33 m³	
CA80	294.3	Área de forma = 321.90 m²	





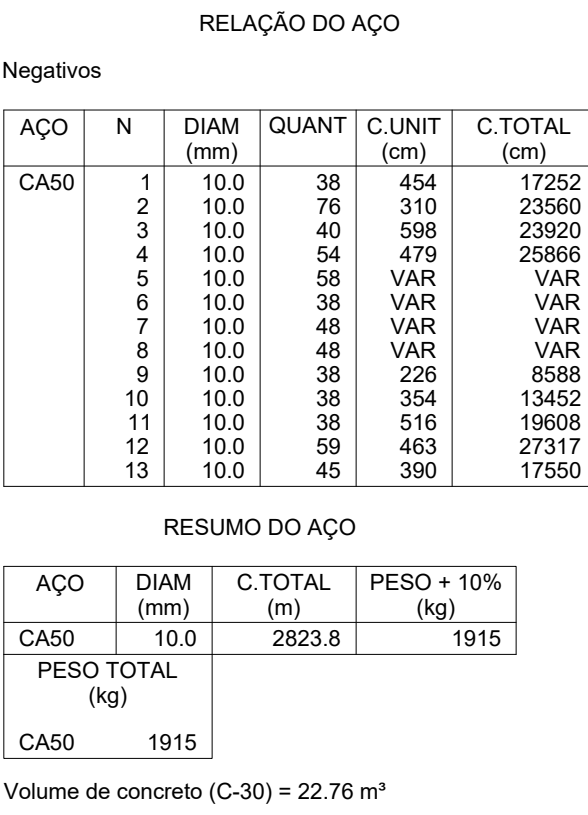
RELAÇÃO DO AÇO

ACO	N	DIAM (mm)	QUANT	C UNIT (cm)	C TOTAL (cm)
CA50	1	5.0	1709	101	172699
CA50	2	5.0	16	107	1712
CA50	3	6.3	16	101	1616
CA50	4	6.3	1	99	99
CA50	5	6.3	4	478	1912
CA50	6	8.0	4	348	1392
CA50	7	8.0	2	393	786
CA50	8	8.0	350	700	24500
CA50	9	8.0	416	832	34611
CA50	10	8.0	363	730	26451
CA50	11	8.0	225	450	10125
CA50	12	8.0	365	730	26655
CA50	13	8.0	2	270	540
CA50	14	8.0	2	336	672
CA50	15	8.0	2	280	560
CA50	16	8.0	2	385	770
CA50	17	8.0	2	270	540
CA50	18	8.0	2	336	672
CA50	19	8.0	165	330	5445
CA50	20	8.0	2	220	440
CA50	21	8.0	300	600	18000
CA50	22	8.0	355	710	25305
CA50	23	8.0	155	310	4805
CA50	24	8.0	2	210	420
CA50	25	10.0	381	762	29112
CA50	26	10.0	415	830	34415
CA50	27	10.0	434	868	37512
CA50	28	10.0	345	690	23805
CA50	29	10.0	465	930	43050
CA50	30	10.0	555	1110	61515
CA50	31	10.0	510	1020	52020
CA50	32	10.0	8	164	1312
CA50	33	12.5	3	217	651
CA50	34	12.5	3	784	2352
CA50	35	12.5	21	786	16506
CA50	36	12.5	21	791	16611
CA50	37	12.5	15	791	11865
CA50	38	12.5	15	791	11865
CA50	39	12.5	1	345	345
CA50	40	12.5	1	181	181
CA50	41	12.5	1	486	486
CA50	42	12.5	6	760	4560
CA50	43	12.5	1	504	504
CA50	44	12.5	1	162	162
CA50	45	12.5	1	715	715
CA50	46	12.5	1	404	404
CA50	47	12.5	1	171	171
CA50	48	12.5	1	596	596
CA50	49	12.5	1	334	334
CA50	50	12.5	1	781	781
CA50	51	12.5	1	217	217
CA50	52	12.5	1	571	571
CA50	53	12.5	2	795	1590
CA50	54	16.0	4	1096	4384
CA50	55	16.0	10	188	1880
CA50	56	16.0	4	1123	4492
CA50	57	16.0	2	975	1950
CA50	58	16.0	2	955	1910
CA50	59	16.0	4	1196	4784
CA50	60	16.0	2	1200	2400
CA50	61	16.0	2	756	1512
CA50	62	16.0	2	841	1682
CA50	63	16.0	4	1196	4784
CA50	64	16.0	2	841	1682
CA50	65	16.0	823	1646	13618
CA50	66	16.0	1029	2058	21182
CA50	67	16.0	525	1050	5505
CA50	68	16.0	395	790	3120
CA50	69	16.0	330	660	2178
CA50	70	16.0	330	660	2178
CA50	71	16.0	330	660	2178
CA50	72	16.0	2	502	1004
CA50	73	16.0	2	502	1004
CA50	74	16.0	2	1136	2272
CA50	75	16.0	2	985	1970
CA50	76	16.0	2	440	880

PESO TOTAL (kg) 2967.7

Volume de concreto (C-30) = 20.33 m³

Área de forma = 321.90 m²



		Lajes				Subscreva (kg/m ²)		
Nome	Tipo	Altura (cm)	Duração (cm)	Nível (cm)	Peso próprio (kg/m ²)	Adiciona	Acidental	Localidade
L101	Pre-moldada	20	0	395	202	182	50	-
L102	Pre-moldada	20	0	395	202	182	50	-
L103	Pre-moldada	20	0	395	202	182	50	-
L104	Pre-moldada	20	0	395	202	182	50	-
L105	Pre-moldada	20	0	395	202	182	50	-
L106	Pre-moldada	20	0	395	202	182	50	sem
L107	Pre-moldada	20	0	395	202	182	50	-
L108	Pre-moldada	20	0	395	202	182	50	-
L109	Pre-moldada	20	0	395	202	182	50	-
L110	Pre-moldada	20	0	395	202	182	50	sem
L111	Pre-moldada	20	0	395	202	182	50	-
L112	Pre-moldada	20	0	395	202	182	50	-
L113	Pre-moldada	20	0	395	202	182	50	-
L114	Pre-moldada	20	0	395	202	182	50	-
L115	Pre-moldada	20	0	395	202	182	50	-
L116	Pre-moldada	20	0	395	202	182	50	sem
L117	Pre-moldada	20	0	395	202	182	50	-
L118	Pre-moldada	20	0	395	202	182	50	-

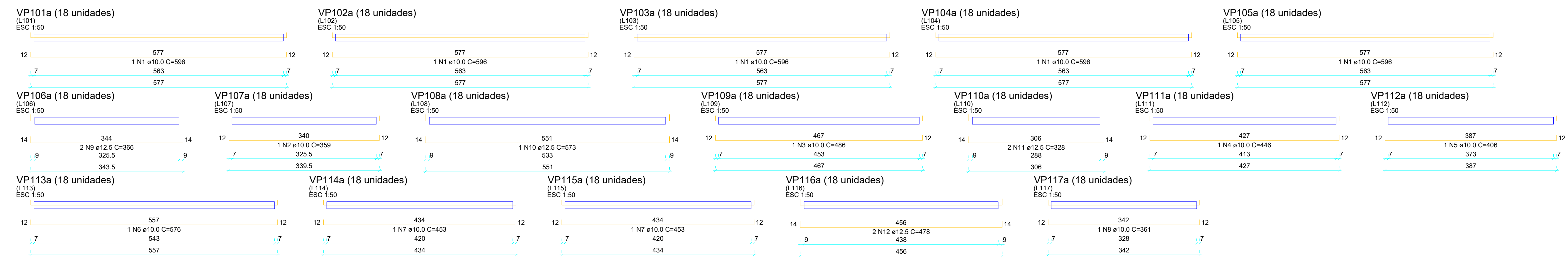
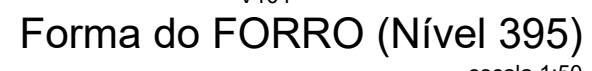
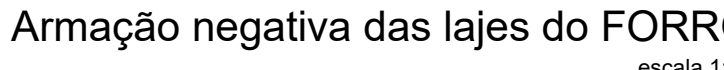
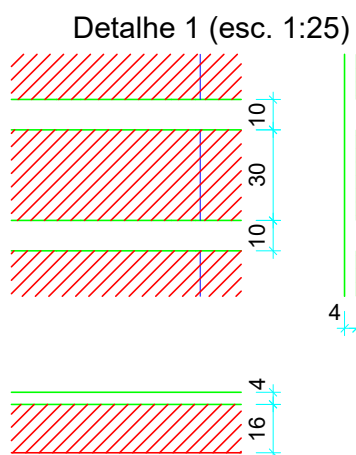
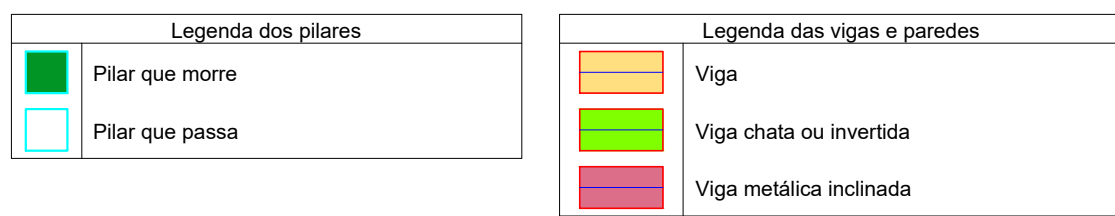
Blocos de enchimento						
Detalhe	Tipo	Nome	Dimensões(cm)			Quantidade
			hb	bx	by	
1	EPS Unidirecional	816/30'125	16	30	125	1348

Área de lajes			
Tipo	Altura (cm)	Bloco de Enchimento	Área (m²)
Nervurada	20	B18/30/125	588.03

Características dos materiais	
fck (kgf/cm²)	Abatimento (cm)
300	5.00

Dimensão máxima do agregado = 19 mm

Name	Phases		Vegs			
	Dir	Enviro	Dir	Enviro		
P1	14400	0	V001	14400	0	395
P2	14400	0	V002	14400	0	395
P3	14400	0	V103	14400	0	395
P4	14400	0	V104	14400	0	395
P5	14400	0	V105	14400	0	395
P6	14400	0	V106	14400	0	395
P7	14400	0	V107	14400	0	395
P8	14400	0	V108	14400	0	395
P9	14400	0	V109	14400	0	395
P10	14440	0	V110	14400	0	395
P11	14440	0	V111	14400	0	395
P12	14440	0	V112	14400	0	395
P13	14440	0	V113	14400	0	395
P14	14440	0	V114	14400	0	395
P15	14440	0	V115	14400	0	395
P16	14440	0	V116	14400	0	395
P17	14440	0	V117	14400	0	395
P18	14440	0	V118	14400	0	395
P19	14440	0	V119	14400	0	395
P20	14440	0	V120	14400	0	395
P21	14400	0	V121	14400	0	395
P22	14400	0	V122	14400	0	395
P23	14400	0	V123	14400	0	395
P24	14400	0	V001	21x15x15x17x20	0 / -35	395
P25	14400	0	V002	21x15x15x17x20	0 / -35	395
P26	14400	0	V003	21x15x15x17x20	0 / -35	395
P27	14400	0	V004	21x15x15x17x20	0 / -35	395
P28	14400	0	V005	21x15x15x17x20	0 / -35	395
P29	14400	0	V006	21x15x15x17x20	0 / -35	395
P30	14400	0	V007	21x15x15x17x20	0 / -35	395
P31	14400	0	V008	21x15x15x17x20	0 / -35	395
P32	14400	0	V009	21x15x15x17x20	0 / -35	395
P33	14400	0	V010	21x15x15x17x20	0 / -35	395
P34	14400	0	V011	21x15x15x17x20	0 / -35	395
P35	14400	0	V012	21x15x15x17x20	0 / -35	395
P36	14400	0	V013	21x15x15x17x20	0 / -35	395
P37	14400	0	V014	21x15x15x17x20	0 / -35	395
P38	14400	0	V015	21x15x15x17x20	0 / -35	395
P39	14400	0	V016	21x15x15x17x20	0 / -35	395
P40	14400	0	V017	21x15x15x17x20	0 / -35	395
P41	14400	0	V018	21x15x15x17x20	0 / -35	395
P42	14400	0	V019	21x15x15x17x20	0 / -35	395
P43	14400	0	V020	21x15x15x17x20	0 / -35	395
P44	14400	0	V021	21x15x15x17x20	0 / -35	395
P45	14400	0	V022	21x15x15x17x20	0 / -35	395
P46	14400	0	V023	21x15x15x17x20	0 / -35	395
P47	14400	0	V024	21x15x15x17x20	0 / -35	395
P48	14400	0	V025	21x15x15x17x20	0 / -35	395
P49	14400	0	V026	21x15x15x17x20	0 / -35	395
P50	14400	0	V027	21x15x15x17x20	0 / -35	395
P51	14400	0	V028	21x15x15x17x20	0 / -35	395
P52	14400	0	V029	21x15x15x17x20	0 / -35	395
P53	14400	0	V030	21x15x15x17x20	0 / -35	395
P54	14400	0	V031	21x15x15x17x20	0 / -35	395
P55	14400	0	V032	21x15x15x17x20	0 / -35	395
P56	14400	0	V033	21x15x15x17x20	0 / -35	395
P57	14400	0	V034	21x15x15x17x20	0 / -35	395
P58	14400	0	V035	21x15x15x17x20	0 / -35	395
P59	14400	0	V			



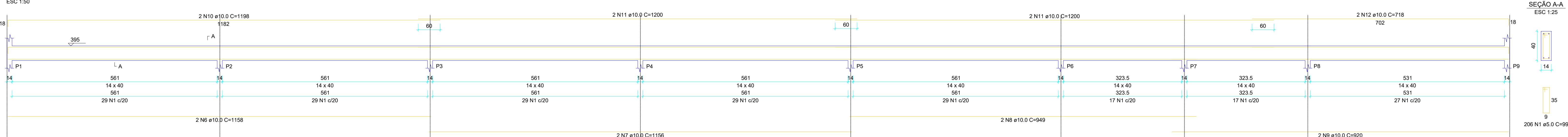
RELACÃO DO AÇO					
AÇO	N	DIAM (mm)	QUANT	C UNIT (cm)	C TOTAL (cm)
CA50	1	10,0	90	596	53640
	2	10,0	18	359	6462
	3	10,0	18	446	8028
	4	10,0	18	446	8028
	5	10,0	18	406	7308
	6	10,0	18	376	6768
	7	10,0	36	453	16308
	8	10,0	18	361	6498
	9	12,5	36	478	17178
	10	12,5	18	573	10314
	11	12,5	36	328	11808
	12	12,5	36	478	17178

RESUMO DO AÇO

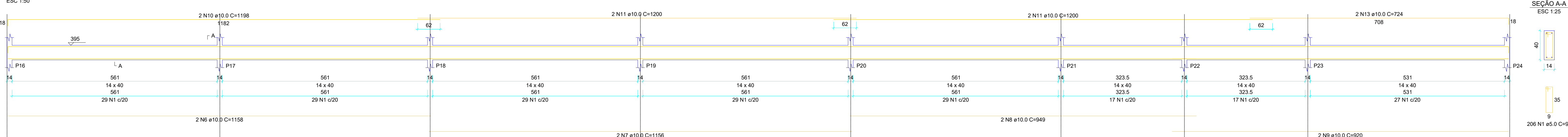
AÇO	DIAM (mm)	C. TOTAL (m)	PESO + 10% (kg)
CA50	10.0 12.5	1173.6 525.1	795.9 556.4
PESO TOTAL (kg)			
CA50	1352.3		

Volume de concreto (C-30) = 0.00 m³

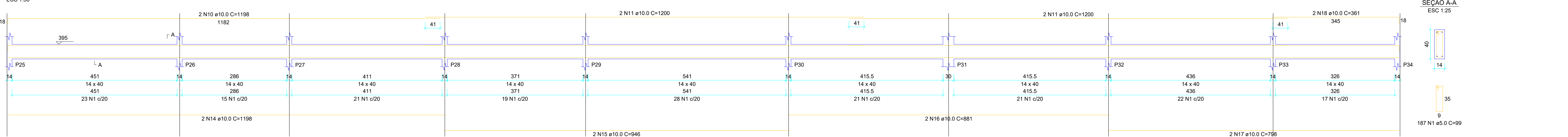
V101



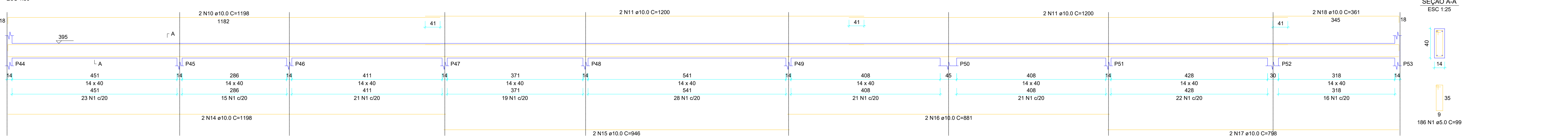
V102



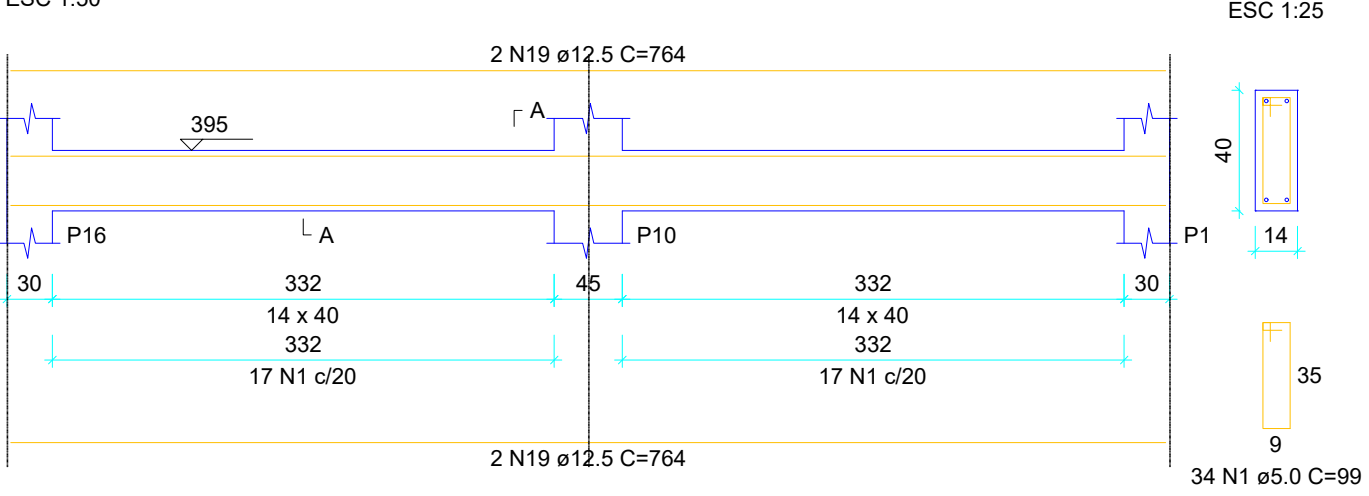
V103



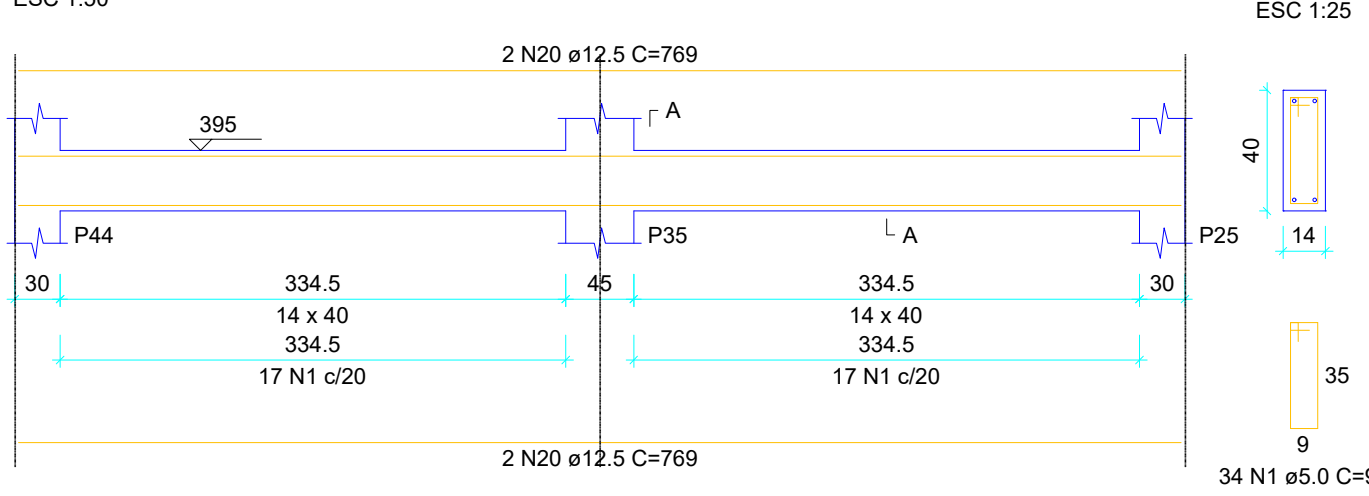
V104



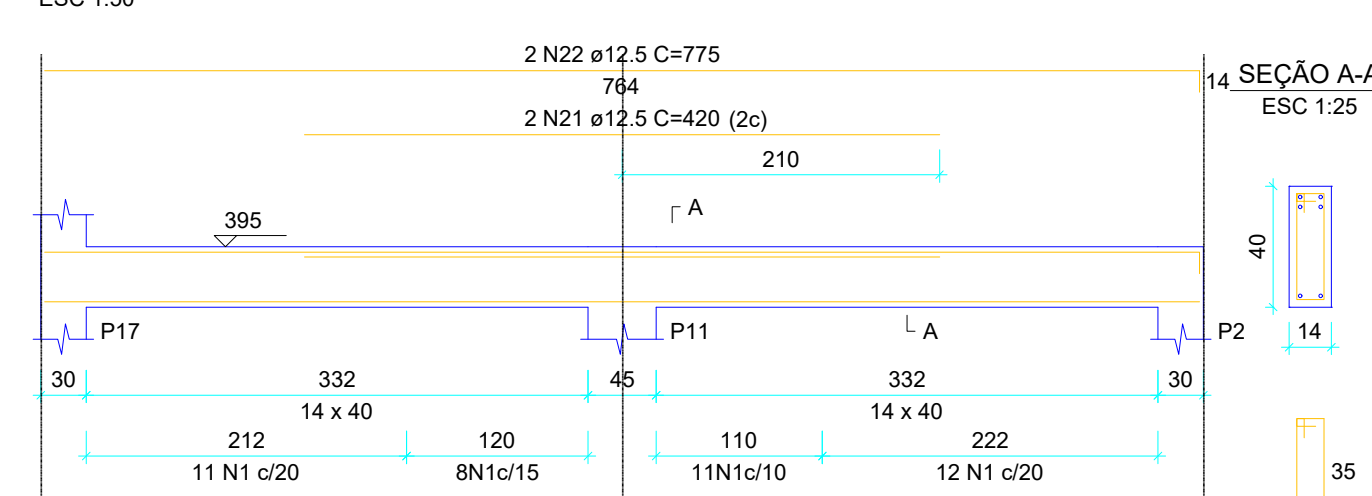
V105



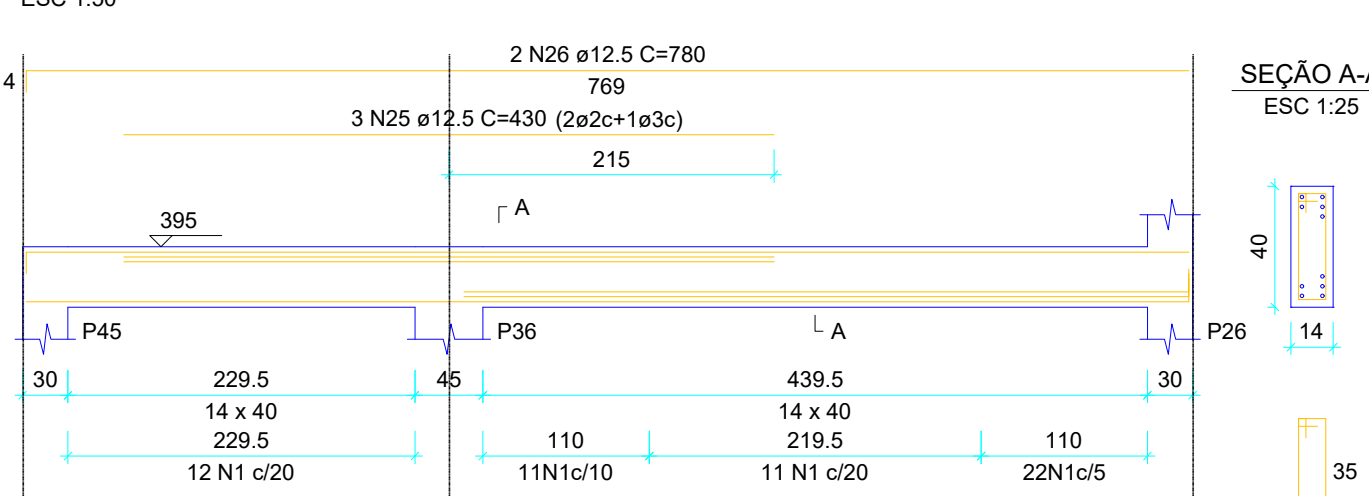
V106



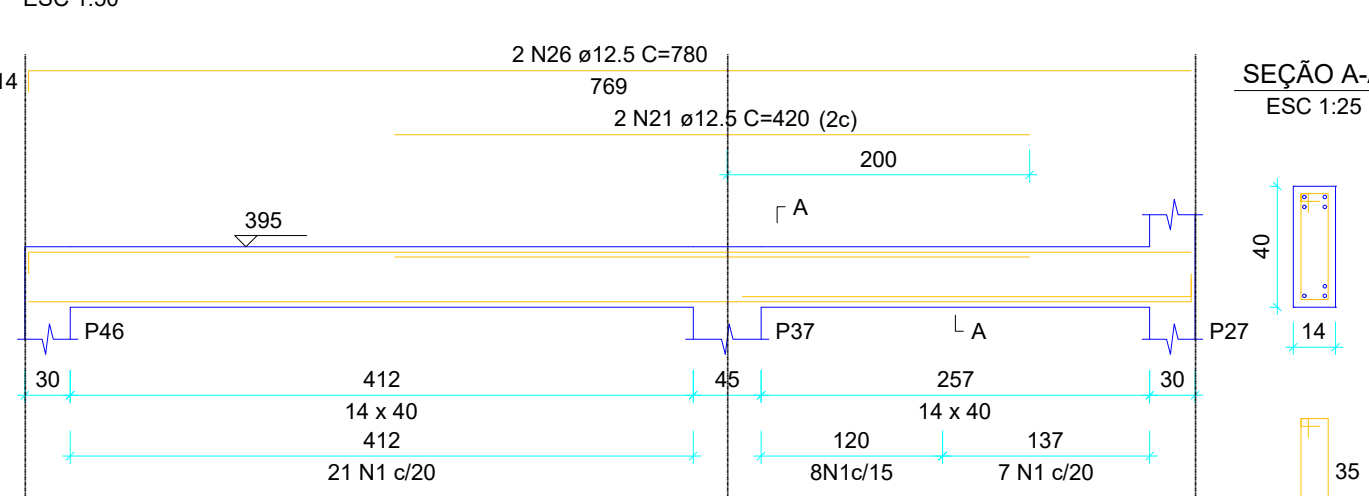
V107



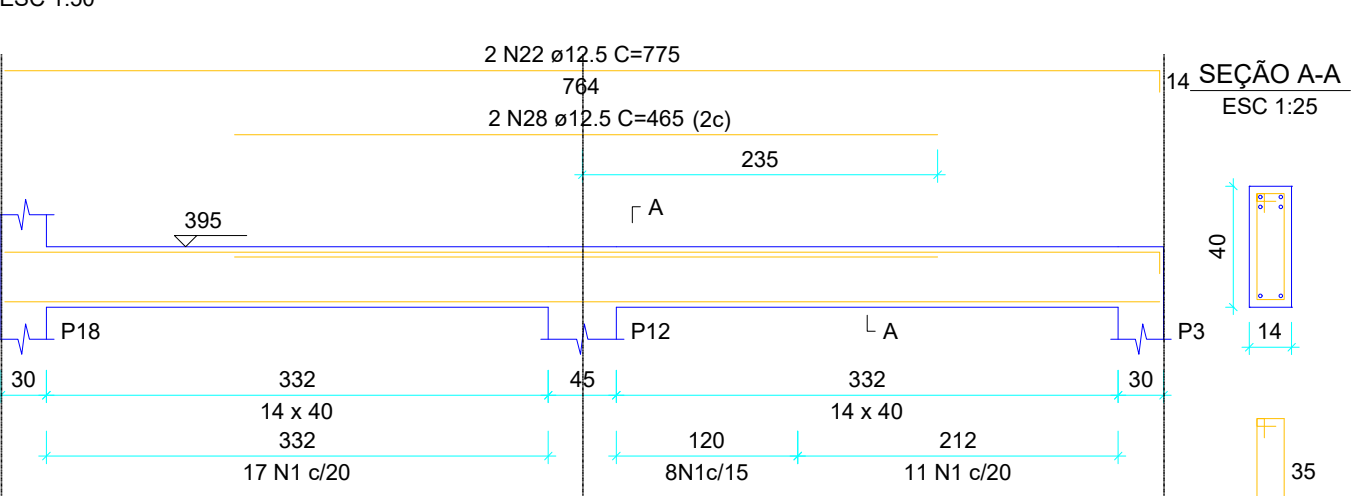
V108



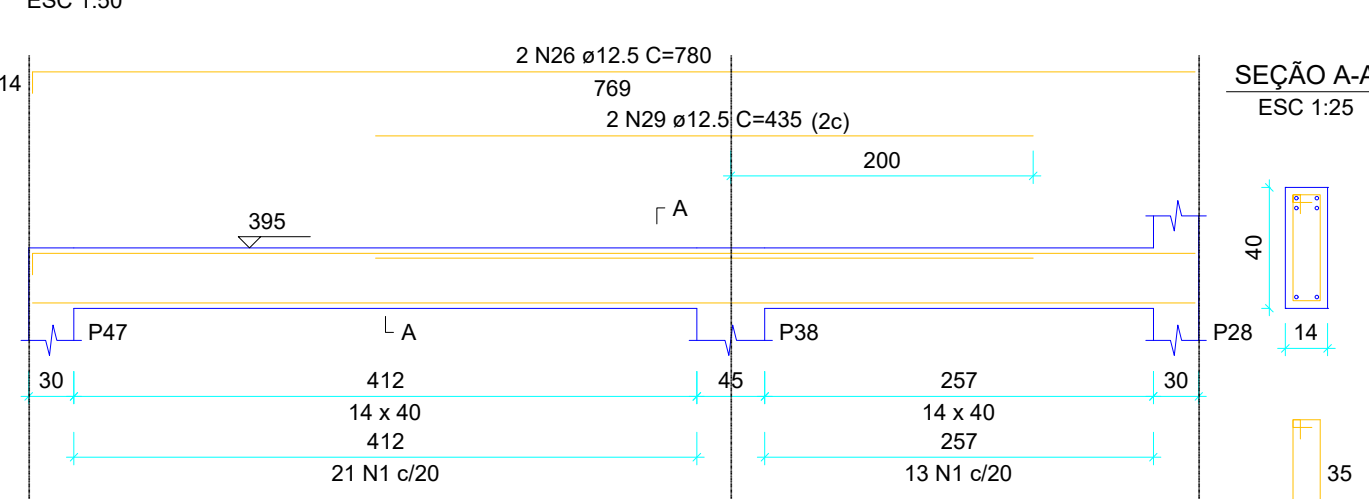
V109



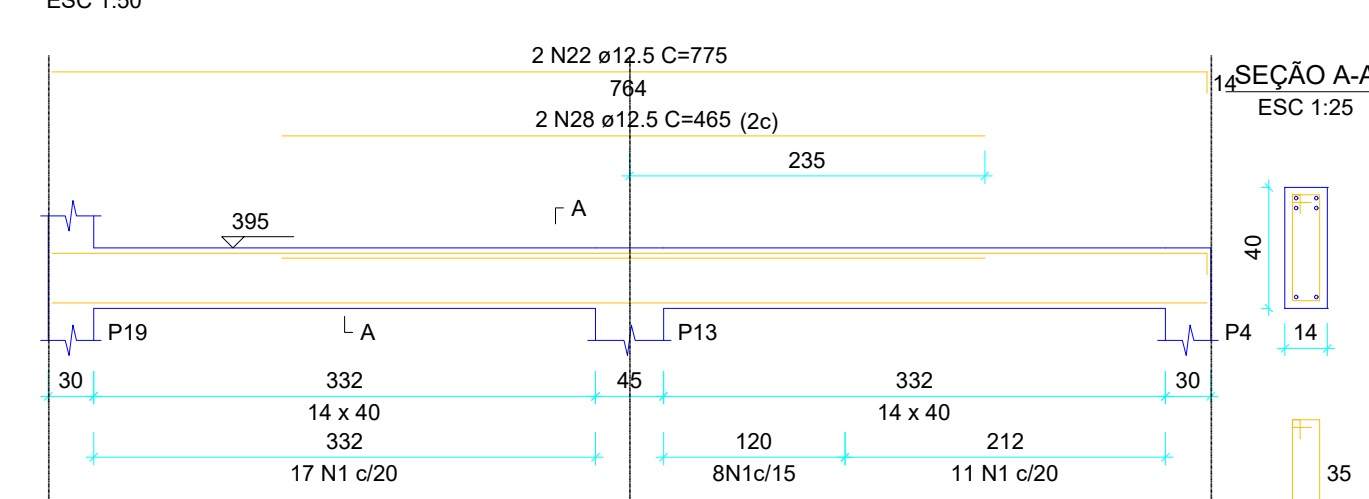
V110



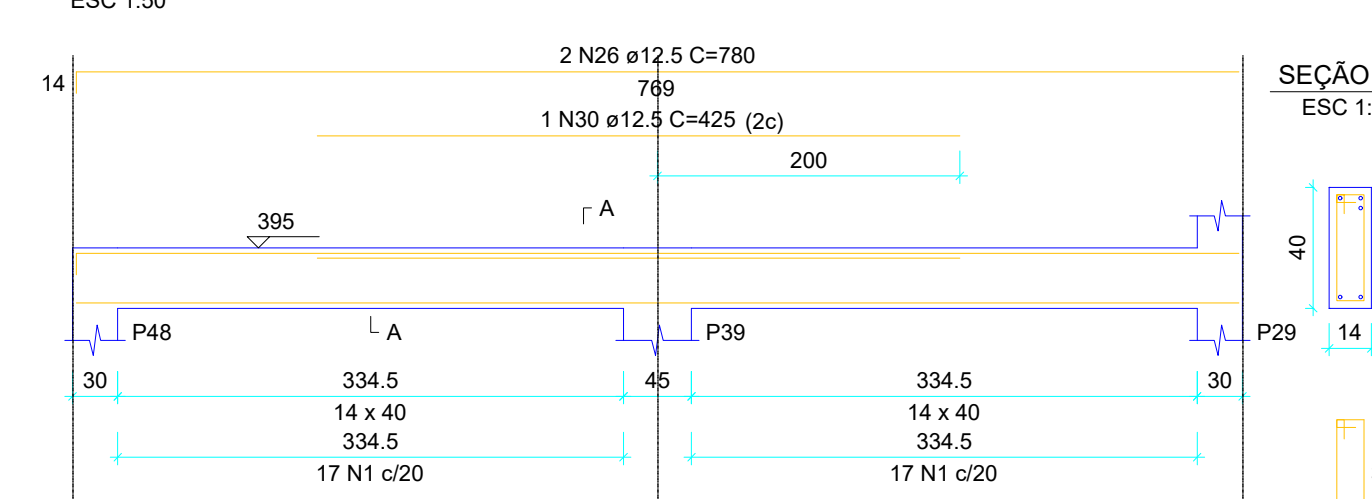
V111



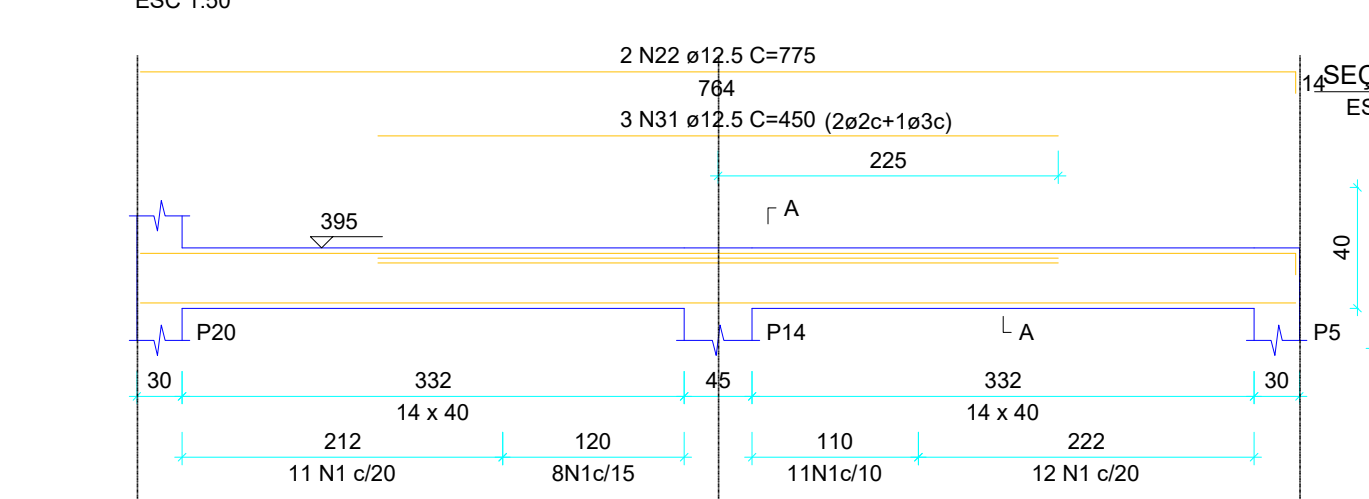
V112



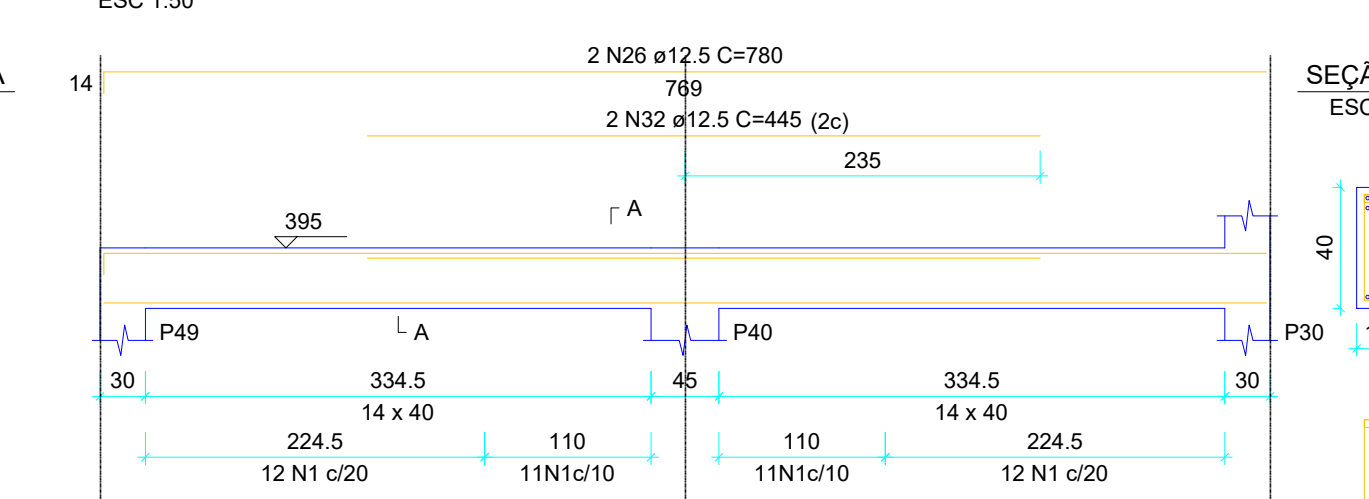
V113



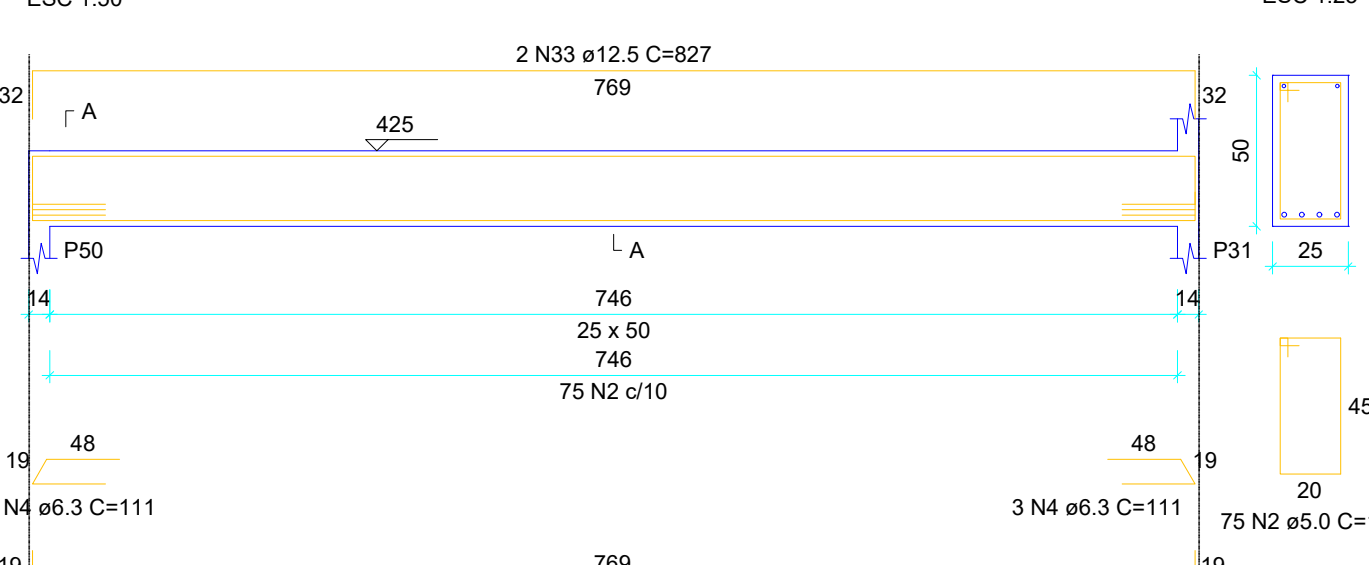
V114



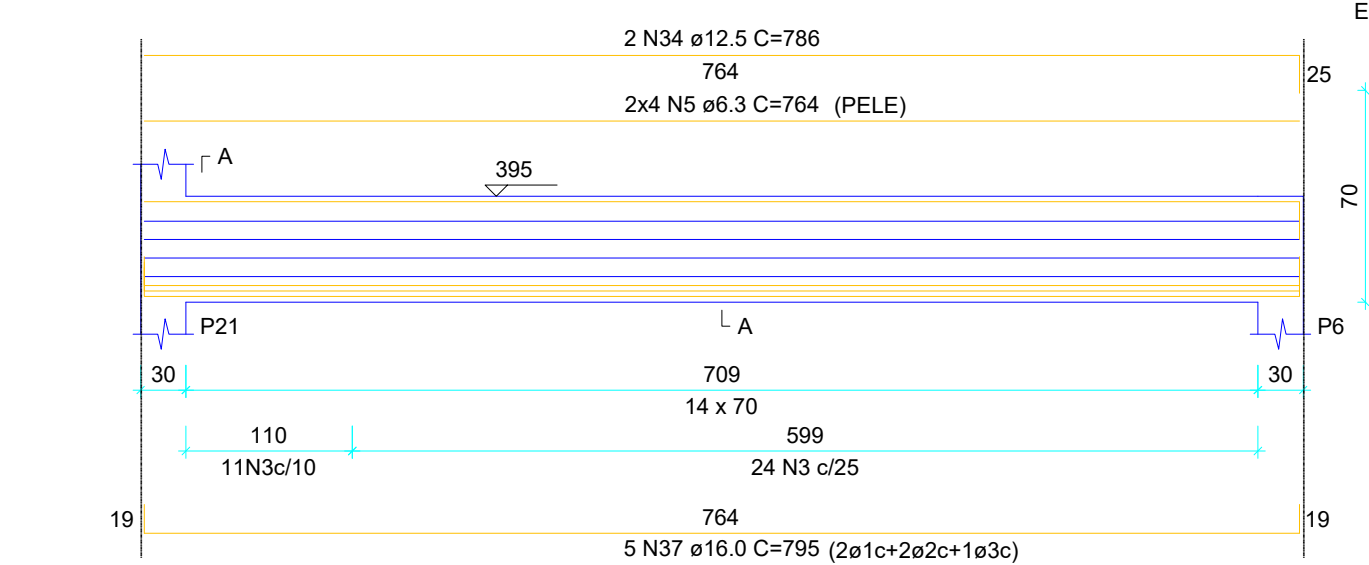
V115



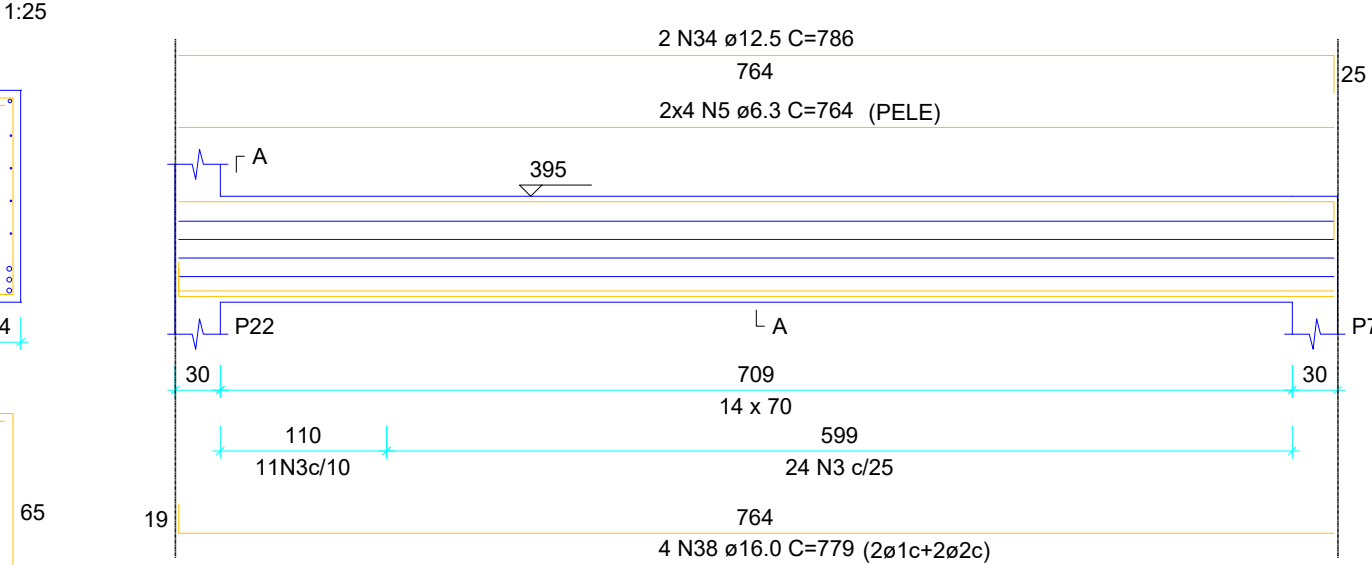
V116



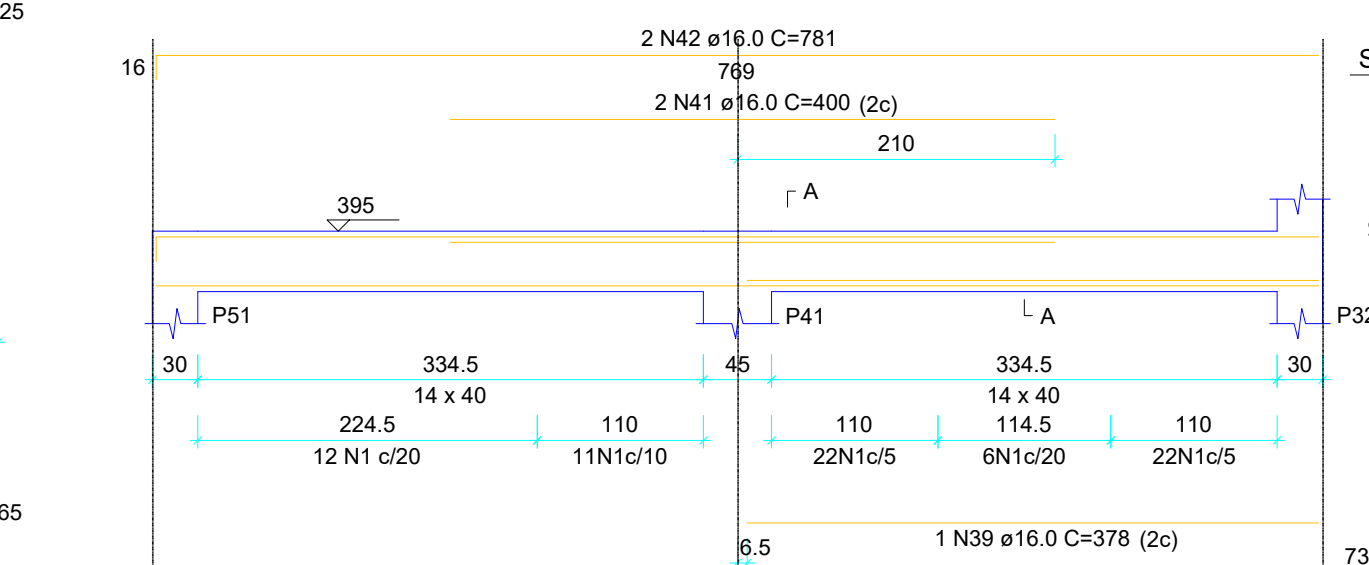
V117



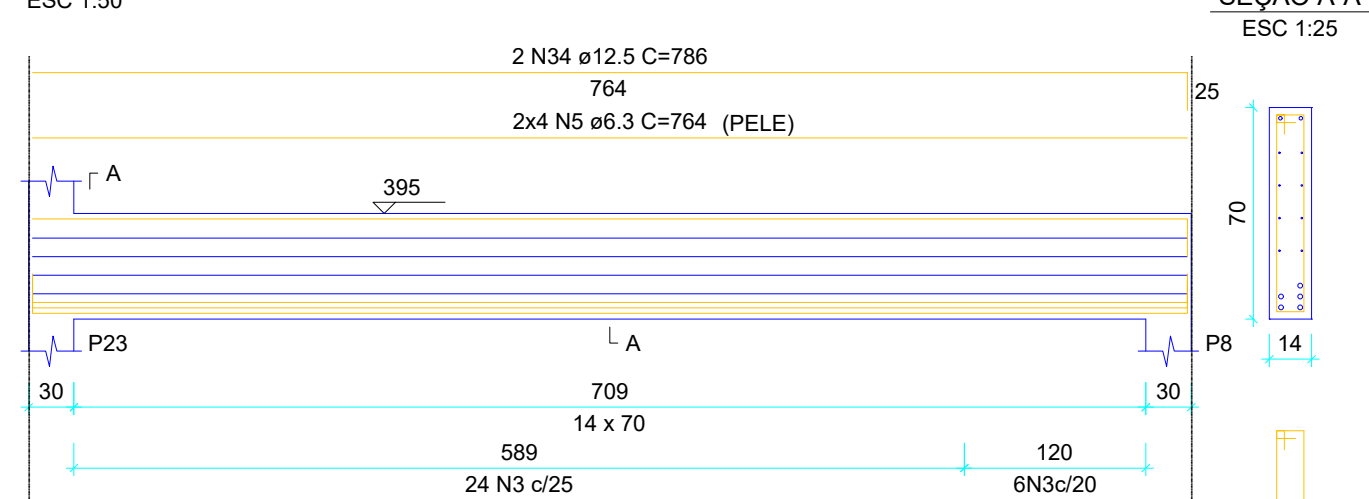
V118



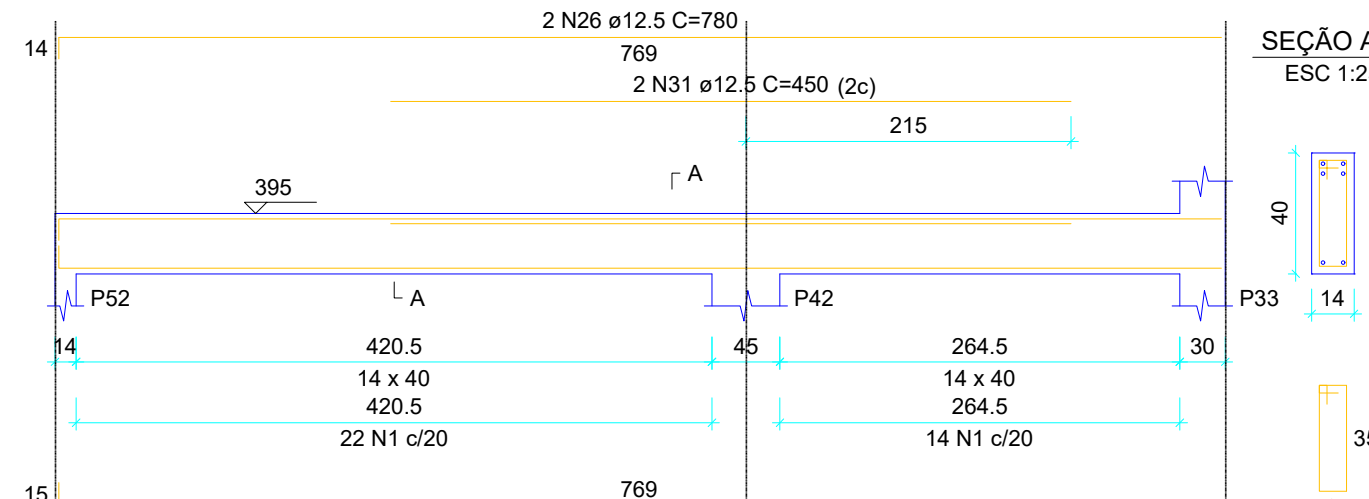
V119



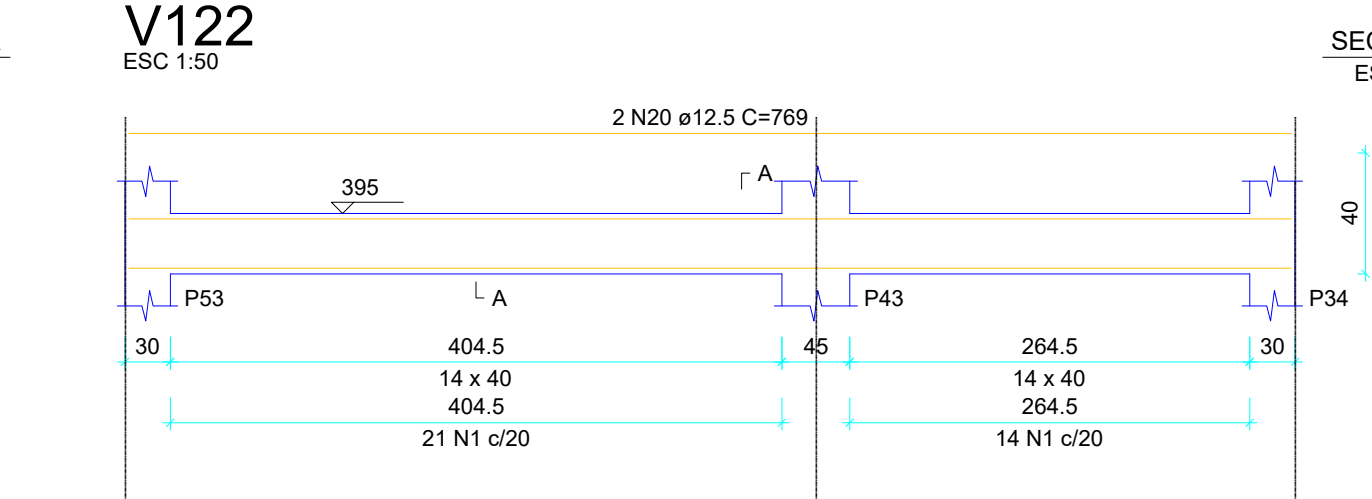
V120



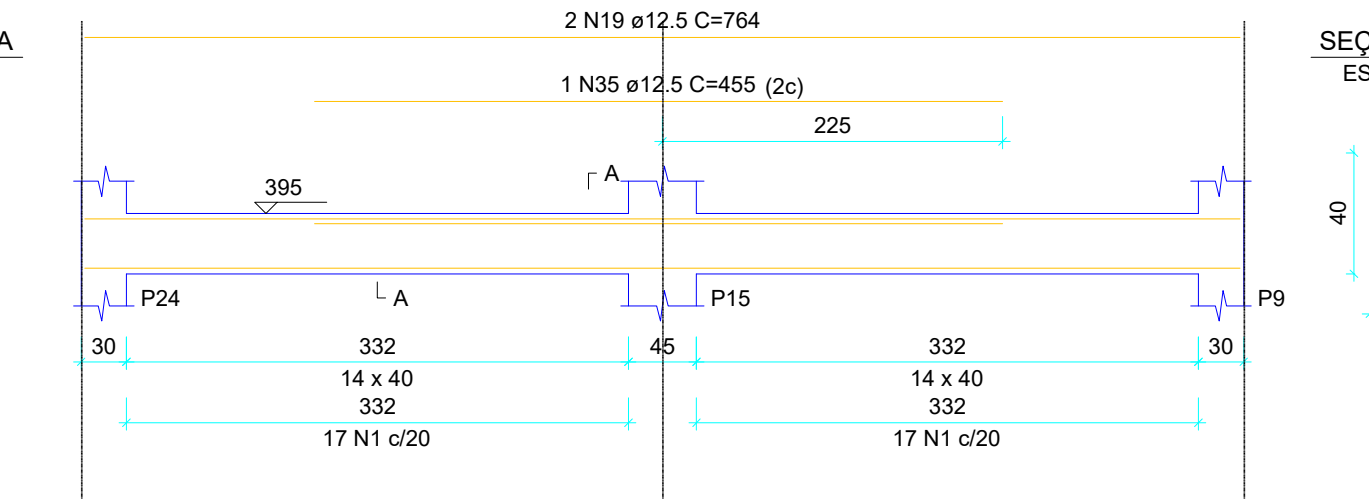
V121



V122



V123



RELAÇÃO DO AÇO					
ACO	N	DIAM (mm)	QUANT	C.UNIT (cm)	C.TOTAL (cm)
V101	1	5.0	1393	99	137907
V104	2	5.0	75	141	10575
V107	3	5.0	100	159	15900
V110	4	6.3	8	111	888
V113	5	6.3	24	764	18336
V115	6	10.0	4	1158	4632
V116	7	10.0	4	1156	4624
V118	8	10.0	4	840	3360
V119	9	10.0	4	920	3680
V120	10	10.0	8	1198	9584
V122	11	10.0	16	1200	19200
	12	10.0	2	718	1436
	13	10.0	2	718	1436
	14	10.0	4	946	3784
	15	10.0	4	1198	4792
	16	10.0	4	881	3524
	17	10.0	4	798	3192
	18	10.0	4	361	1444
	19	12.5	16	764	12224
	20	12.5	14	768	10768
	21	12.5	3	430	1290
	22	12.5	8	775	6200
	23	12.5	3	430	1290
	24	12.5	6	781	4686
	25	12.5	3	430	1290
	26	12.5	12	790	9480
	27	12.5	1	309	1236
	28	12.5	4	460	1840
	29	12.5	2	435	870
	30	12.5	1	445	445
	31	12.5	5	440	2200
	32	12.5	1	445	445
	33	12.5	2	827	1654
	34	12.5	6	786	4716
	35	12.5	1	455	455
	36	16.0	4	850	3400
	37	16.0	10	795	7950
	38	16.0	4	779	3116
	39	16.0	1	378	378
	40	16.0	2	699	1398
	41	18.0	2	400	800
	42	16.0	2	731	1462

RESUMO DO AÇO			
ACO	DIAM (mm)	C.TOTAL (m)	PESO = 10% (kg)
CASO	5.0	651.4	511.7
	10.0	611.1	441.7
	16.0	185.4	322
	5.0	1643.8	278.7
PESO TOTAL (kg)			
CASO		1482.4	
CASO		278.7	
Volume de concreto (C-30) = 18.58 m³			
Área de forma = 302.91 m²			

PREFEITURA:

CREA:

VORTEX
ENGENHARIA E PROJETOS
AV. ANTONIO CARLOS DE MOURA, 100 - JARDIM CAMARGAS
SANTOS - SP - 13506-000
FONE: (13) 3333-1111
WWW.VORTEXENGENHARIA.COM.BR

PROJETO ESTRUTURAL
REVISÃO DA OBRA:
RODOVIA MG 223, km 12 - ALTO SÃO JOÃO - ARAGUARI

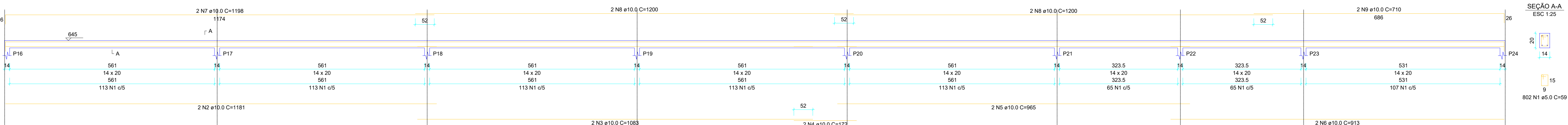
PROJETISTAS ASSINATURAS
PREFEITURA MUNICIPAL DE ARAGUARI
ONG - 18 DE SETEMBRO DE 1961
AUTOR DO PROJETO:
ENG. CIVIL FÁBIO RODRIGUES DA COSTA
CREA: 111.194.010-0
COAUTOR DO PROJETO:
ENG. CIVIL MARCELO MIRANDA FARIAS
CREA: 258.870-010-0

CONTEUDO:
DETALHAMENTO DAS VIGAS DO FORRO V101 A V123

DATA:
07/05/2019
INDICADA:
05/07
REVISÃO:
MMF

V201

ESC 1:50



SEÇÃO A-A
ESC 1:25

14

15

802 N1 ø5.0 C=59

RELAÇÃO DO AÇO						
ACO	N	DIAM (mm)	QUANT	C UNIT (cm)	C TOTAL (cm)	
CABO	2	5.0	2076	59	122484	
CABO	3	10.0	2	1083	2166	
CABO	4	10.0	4	172	688	
CABO	5	10.0	2	965	1930	
CABO	6	10.0	2	913	1826	
CABO	7	10.0	2	1188	2376	
CABO	8	10.0	8	1200	9600	
CABO	9	10.0	2	710	1420	
CABO	10	10.0	2	1101	2202	
CABO	11	10.0	2	969	1938	
CABO	12	10.0	2	804	1608	
CABO	13	10.0	2	798	1596	
CABO	14	10.0	2	1198	2396	
CABO	15	10.0	2	354	708	
CABO	16	10.0	4	764	3056	
CABO	17	10.0	4	811	3244	
CABO	18	10.0	4	769	3076	
CABO	19	10.0	4	816	3264	

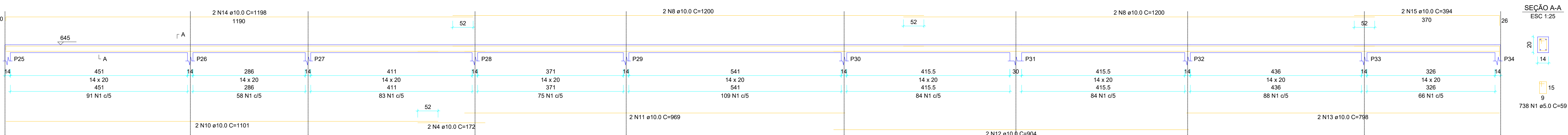
RESUMO DO AÇO

ACO	DIAM (mm)	C TOTAL (m)	PESO + 10% (kg)
CABO	10.0	457.6	310.3
CABO	5.0	1224.8	207.7
PESO TOTAL (kg)			518.0
CABO			207.7

Volume de concreto (C-30) = 3.08 m³
Área de forma = 59.42 m²

V202

ESC 1:50



SEÇÃO A-A
ESC 1:25

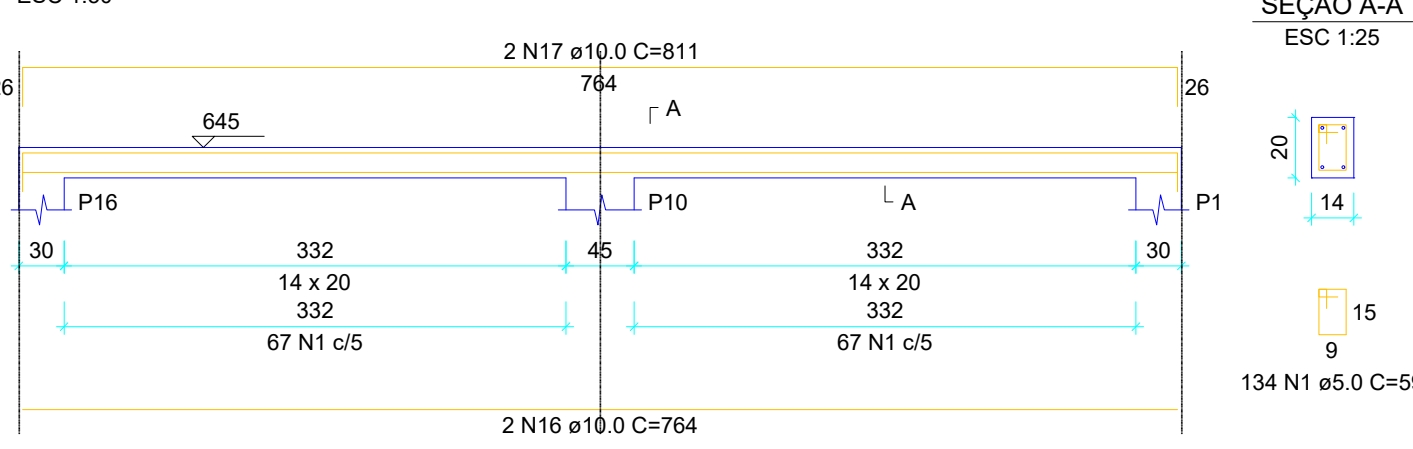
14

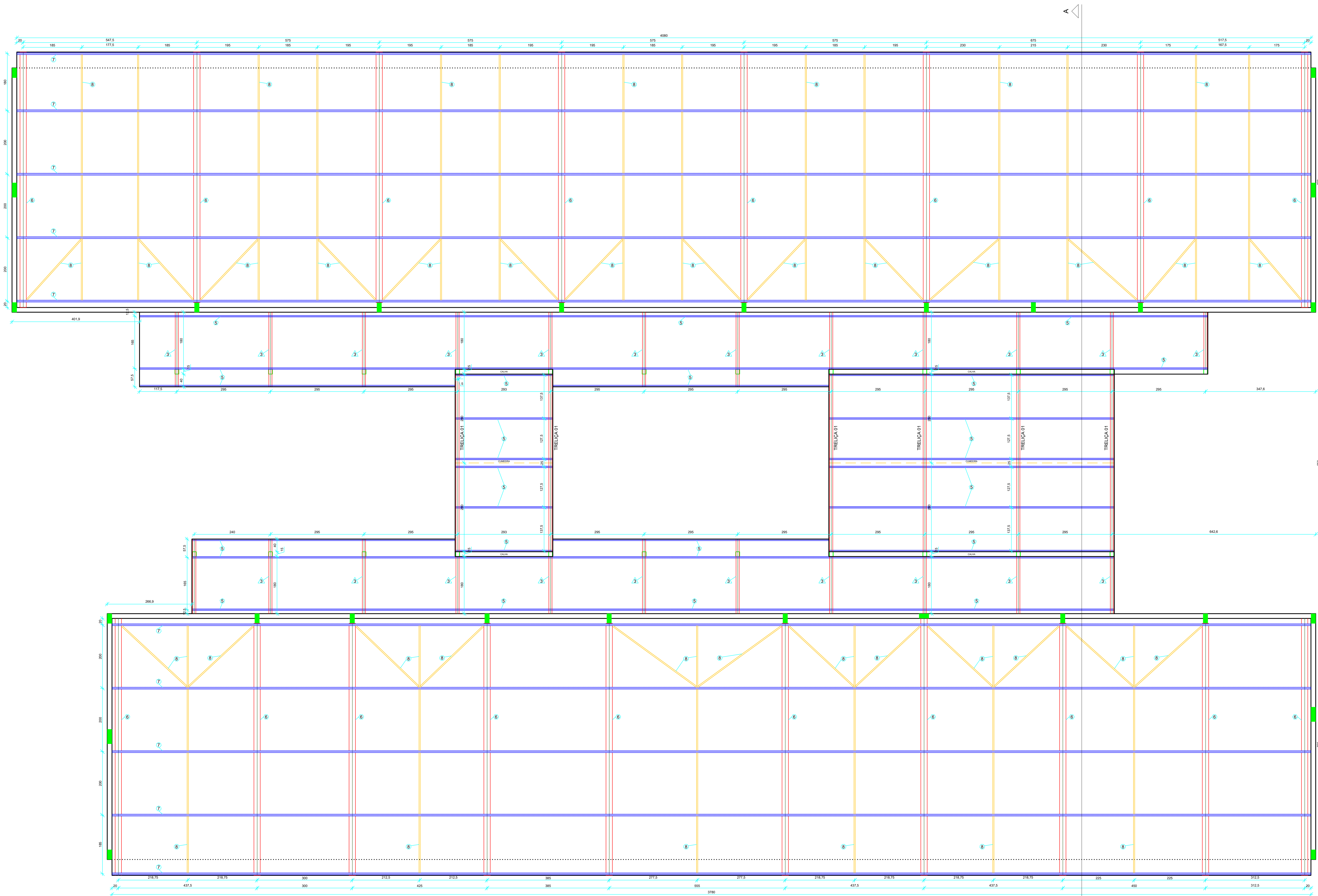
15

738 N1 ø5.0 C=59

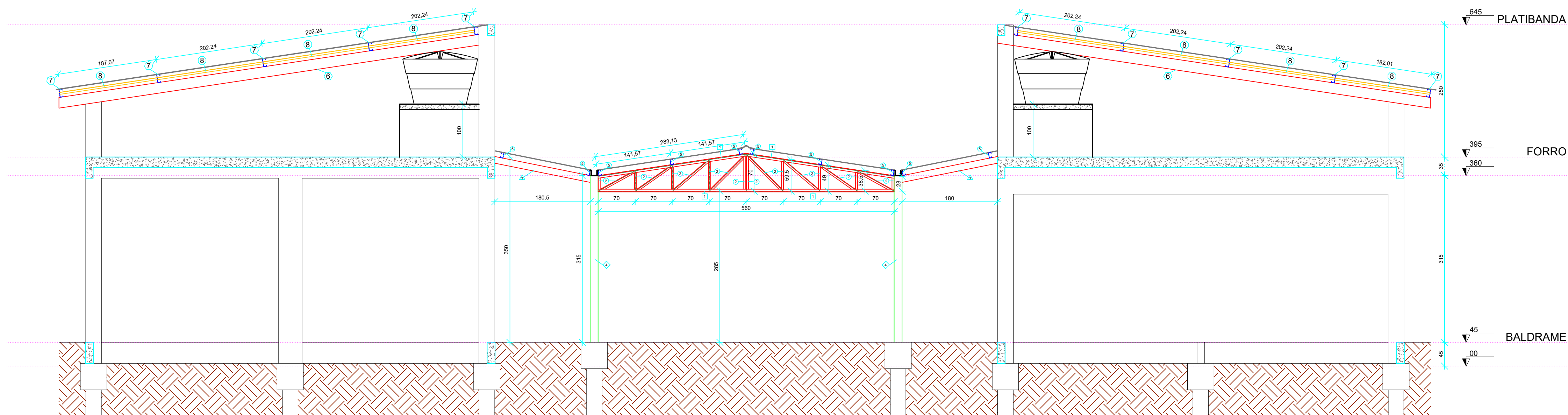
V203

ESC 1:50





DETALHAMENTO DA COBERTURA
escala 1:50



CORTE AA
escala 1:50

ITEM	ESPECIFICAÇÃO DOS PERFIS	SEÇÃO
1	PERFIL "U" 100x40x12	U
2	PERFIL "U" 90x40x12	U
3	PERFIL "U" 150x60x20x3.00	U
4	PERFIL "U" 150x60x20x3.00	U
5	PERFIL "U" 100x40x12x0.00	U
6	PERFIL "U" 200x100x25x3.35	U
7	PERFIL "U" 150x60x20x3.75	U
8	PERFIL "L" 1.12"x1.12"x1/8"	L

RESUMO DOS MATERIAIS

Material	Família	Grupo	Seção	Compr. (m)	Peso (kg)
Apo estrutural ASTM - A242	Família Ue	U - Enrijecido de chapa dobrada (Seção U enrijecido)	Ue100x40x12x0.00	234.00	811.98
Apo estrutural ASTM - A242	Família Ue	U - Enrijecido de chapa dobrada (Seção U enrijecido)	Ue125x50x17x2.00	102.00	393.72
Apo estrutural ASTM - A242	Família Ue	U - Enrijecido de chapa dobrada (Seção U enrijecido)	Ue150x60x20x3.00	150.00	1026.00
Apo estrutural ASTM - A242	Família Ue	U - Enrijecido de chapa dobrada (Seção U enrijecido)	Ue150x60x20x3.75	396.00	3326.40
Apo estrutural ASTM - A242	Família Ue	U - Enrijecido de chapa dobrada (Seção U enrijecido)	Ue200x100x25x3.35	300.00	3375.00
Apo estrutural ASTM - A242	Família U	U de chapa dobrada (Seção U)	U90x40x2.88	78.00	266.32
Apo estrutural ASTM - A242	Família U	U de chapa dobrada (Seção U)	U100x50x2.88	72.00	293.04
Apo estrutural ASTM - A242	Família L	Cantoneira de aço laminado (Seção L)	L 1 1/2"x1 1/2"x1/8"	234.00	428.22
PESO TOTAL					9.922,68 kg

LIGAÇÕES DOS PERFIS

- TODAS AS LIGAÇÕES ENTRE PERFIS DEVERÃO SER SOLDADAS, COM SOLDA DO TIPO MIG/MAG (ARCO ELÉTRICO COM PROTEÇÃO GASOSA - GMAW), AWS 5.28 ER70S-7

PREFEITURA:

CREA:

VORTEX
ENGENHARIA E PROJETOS
AV. ANTONIO CARLOS DA SILVA, 100 - JARDIM MIRASSOL
SÃO CARLOS - SP - 13506-900
FONE: (19) 3333-0000
WWW.VORTEXENGENHARIA.COM.BR

PROJETO ESTRUTURAL

PROJETO DA OBRA:
RODOVIA MG 223, km 12 - ALTO SÃO JOÃO - ARAGUARI

PROJETADO POR:

PREFEITURA MUNICIPAL DE ARAGUARI

AUTOR DO PROJETO:

ENG. CIVIL FABRICIO RODRIGUES DA COSTA

COAUTOR DO PROJETO:

ENG. CIVIL MARCELO MIRANDA FRAGAS

CONTEÚDO:

DETALHAMENTO DA ESTRUTURA METÁLICA DA COBERTURA

DATA:

07/05/2019

INDICADA:

07/07

ELABORADO:

MMF